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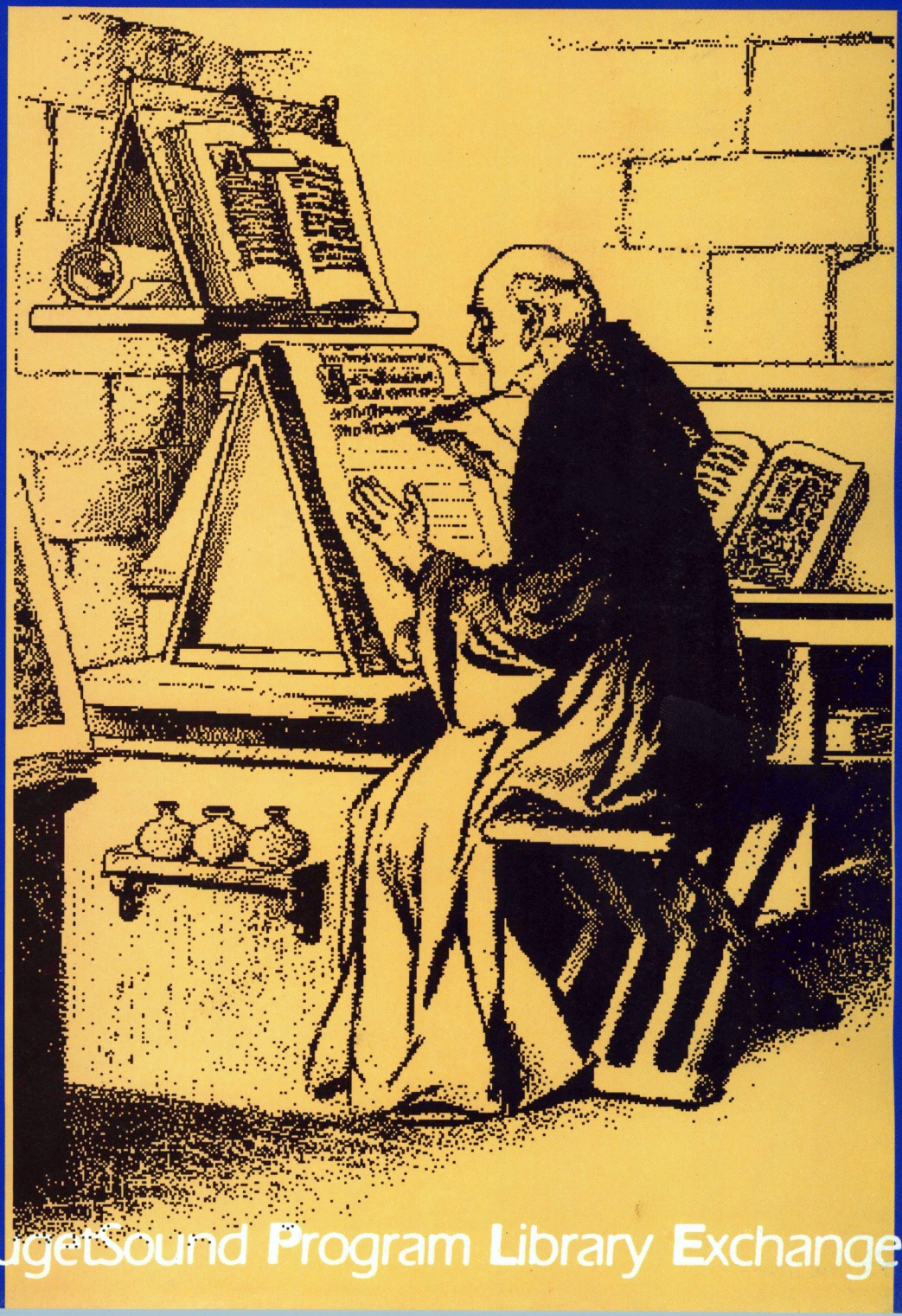
World's Largest Apple User Group Magazine

February 1987 • $3.00 U.S.

Word Processing

- Three New Approaches to Word Processing
- From IIe to IIGS and Beyond
- A Musical Fanfare
- A COPY Command for ProDOS
- Working with Macros Part II
- Please Pass the Graphics
- And... More!



Apple PugetSound Program Library Exchange

Power Play.

In personal computer performance, power makes the difference. When you increase your computer power, you improve your performance. It's that simple.

WordPerfect 1.1 for the Apple IIe/IIc and the new Apple IIGS* works on that perfectly simple premise. And works beautifully. WordPerfect 1.1 is the word processor designed to get the most out of your Apple IIe/IIc or IIGS. The most power. The most efficiency. The most functions. And the most for your money.

Power to the Core.

WordPerfect 1.1 will give your Apple the power to process your words, thoughts and ideas like never before. With scores of useful and unique functions, WordPerfect will do almost any word processing task you can imagine.

For instance, with WordPerfect 1.1 you can do footnotes, with automatic numbering and placement at the bottom of the page. And you can create macros, do a mail merge, set headers and footers, and check your spelling with WordPerfect's 50,000-word dictionary (115,000 words on Apple IIGS).

Plus text entry and display on WordPerfect 1.1 is twice as fast as on the previous version. And WordPerfect now supports true proportional printing for both HMI and microspacing printers.

WordPerfect 1.1 features include:

- 50,000-word spelling dictionary (115,000 on Apple IIGS)
- Align on any character
- Automatic formatting on screen
- Automatic page numbering
- Block features (bold, delete, move, save, underline, etc.)
- Bold and underline text
- Center text
- Chaining of macros
- Comprehensive file management
- Date set/format/insertion
- Extensive printer/font definition
- Flush right
- Footnotes
- Headers and footers
- Hyphenation, automatic prompting
- Indent left and left/right
- Macros
- Mail merge
- Overstrike
- Right justification
- Search and replace
- Super/subscripts
- Text file create/edit/invoke
- Widow/orphan protection
- Word look-up and count
- And more.

Easy as Pie.

For all its capabilities and functions, WordPerfect 1.1 is remarkably easy to learn and use. By utilizing designated function keys and a template, WordPerfect doesn't require you to memorize strings of keystrokes. Features like bold, underline and center are easy to locate and just a couple of simple keystrokes away.

In addition, WordPerfect's newly revised step-by-step manual contains thorough learning examples for beginners and a complete reference section for experienced users. And on-line help screens are provided for easy assistance with individual functions.

An install program is also included to let you take advantage of expanded memory and other ProDOS-compatible hardware.

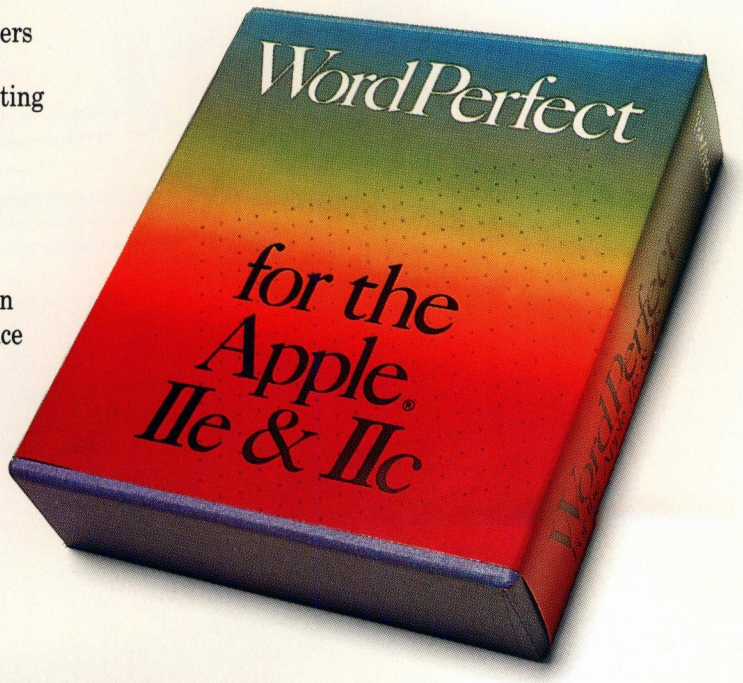
Harvest the Power.

Give your Apple a power boost today. Get WordPerfect 1.1 for the Apple IIe/IIc and IIGS. It's the perfect way to squeeze the most out of your Apple.

For more information, call or write WordPerfect Corporation, 288 West Center St., Orem, Utah 84057 (801) 227-4000.

*Runs under ProDOS-16.

WordPerfect CORPORATION

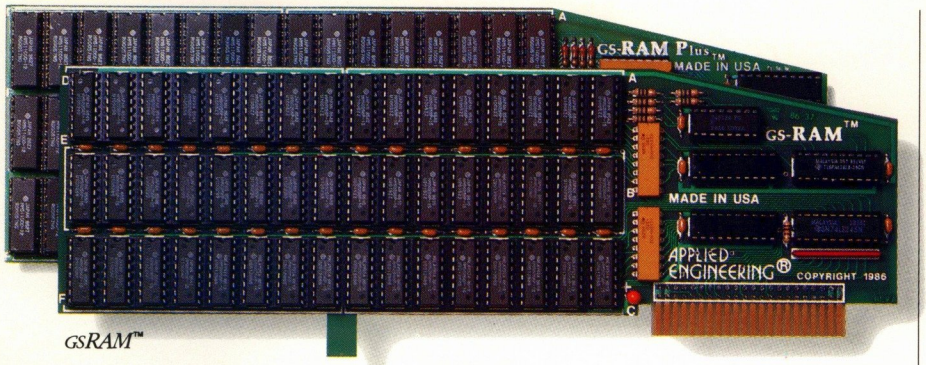


CIRCLE **25** ON READER SERVICE CARD

Insist on GSRAM™ When You Buy Your IIGS™

Expand the IIGS RAM and ROM with the GSRAM or GSRAM Plus with ROM Pak. Available now with 256K to 8 MEG!

GSRAM Plus™



GSRAM™

Remember the 16K cards for the II+ and the 64K cards for the IIe? At the time, that much memory seemed like a lot. But when the owners of these memory cards came to us for more memory, many had to throw away their smaller Apple memory cards or try to sell them. Most of our customers told us that had they known about Applied Engineering's larger memory cards when they bought their Apple, they would have purchased them at the same time.

GSRAM and GSRAM Plus are available now, allowing up to 8 MEG of memory expansion. That's 8 times the memory capacity of Apple's card and just look at the benefits that only GSRAM and GSRAM Plus have over Apple's card:

- Lower cost
- Has 6 RAM banks (Apple's card has 4)
- Has memory expansion port
- Has ROM expansion port
- No configuration blocks to set
- No soldered in RAM chips
- Expandable to 8 MEG
- Expands AppleWorks internal limits
- Built-in Hi-Res self-diagnostic software
- 5 year hassle free warranty (Apple has a 90 day warranty)
- Made in USA

GSRAM for More AppleWorks Power

Only GSRAM and GSRAM Plus eliminates AppleWorks internal memory limits, increasing the maximum number of records available from 6,000 to over 25,000 and only GSRAM and GSRAM Plus increases the number of lines permitted in the word processing mode from 6,000 to over 15,000. And only GSRAM and GSRAM Plus offers a built-in printer buffer so you can continue using AppleWorks while your printer is printing. GSRAM and GSRAM Plus even expand the number of lines in the clipboard from 255 to 2047 and will auto segment large files so they can be saved on two or more disks. You can even have Pinpoint or Macroworks and your favorite spelling checker in RAM for instant response. GSRAM and GSRAM Plus will even display the time and date right on the AppleWorks screen. Nothing comes close to enhancing AppleWorks so much.

Turn Your IIGS into a Giant

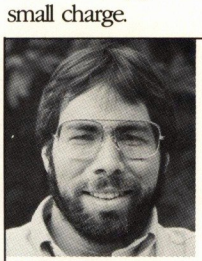
Simply plug GSRAM into the IIGS memory expansion slot and you've got up to *8 megabytes* of RAM at your fingertips—all of it instantly and automatically recognized by the IIGS. GSRAM is compatible with all IIGS software, including AppleWorks, as well as BASIC®, ProDos, DOS 3.3, PASCAL®, "C" and CP/M®.

Grow by Bytes or Megabytes

We offer GSRAM in two configurations so you can increase your memory 256K at a time (GSRAM) or a megabyte at a time (GSRAM Plus). Both offer full compatibility, lower cost than other boards, and easy expandability. And both are extremely low in power consumption. A fully expanded GSRAM operates at only 375 ma, and GSRAM Plus at only 270 ma (even with 6 megabytes on board!)

GSRAM—for Normal Memory Requirements

GSRAM is available with 256K, 512K, 1 MEG or 1.5 MEG of memory already on board. If you don't need the full 1.5 MEG now, you can choose a GSRAM with less memory and expand it up to 1.5 MEG in the future—or upgrade to GSRAM Plus for a small charge.



"I recommend Applied Engineering products wholeheartedly."

Steve Wozniak, the creator of Apple Computer

With an optional piggyback card, you can expand GSRAM even higher than 1.5 MEG! (Other cards are only expandable to 1 MEG.)

GSRAM Plus—for Growing by Leaps and Bounds

GSRAM Plus is the first Apple memory card to use 1 MEG RAM chips on the main board. It's available with 1 to 6 MEG on board. If you don't need the whole 6 MEG now, you can buy a GSRAM Plus with less memory and easily expand it in the future.

GSRAM Plus can be expanded up to 8 MEG with an optional piggyback card.

Easy Expansion

Both GSRAM and GSRAM Plus use standard RAM chips that are readily available and just plug right in. So unlike other cards, you'll find expanding your GSRAM or GSRAM Plus easy, convenient and very economical. And with our optional ROM expansion module you can even increase the IIGS's ROM space and all in just one slot.

Quality and Support of the Industry Leader

Applied Engineering is the largest supplier of Apple peripherals in the world. We *invented* the first large RAM cards for the Apple. With a 5-year "no-hassle" warranty and outstanding technical support, you can be sure GSRAM and GSRAM Plus will deliver the performance you're looking for—or return them within 15 days for a full refund.

GSRAM with 256K	**$169**
GSRAM with 512K	**$219**
GSRAM with 1 MEG	**$299**
GSRAM with 1.5 MEG	**$379**
GSRAM with 2-8 MEG	**CALL**
GSRAM Plus with 1-8 MEG	**CALL**

Order today!

See your dealer or call Applied Engineering today, 9 a.m. to 11 p.m. 7 days. Or send check or money order to Applied Engineering. MasterCard, VISA and C.O.D. welcome. Texas residents add 5⅛% sales tax. Add $10.00 outside U.S.A.

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CIRCLE 3 ON READER SERVICE CARD

Call-A.P.P.L.E.™

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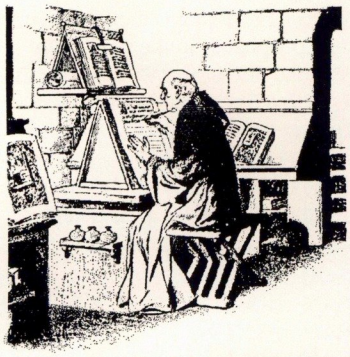

About the Cover

Methods of writing have changed considerably since the days depicted on this cover. Our II's help us express many varied thoughts.

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A.P.P.L.E. Co-op New Products

February 1987 • Prices Expire March 15, 1987

MOUSETALK

from United Software Industries
Apple IIGS, IIc,IIe (128k enhanced required),
Mouse strongly recommended
No Versacard support

ASCII Express Mousetalk stands on the shoulders of a giant: ASCII express, and it shows! It has terminal emulation, XMODEM, macros, and review of the last 8,000 characters of your terminal session, especially handy when you forget to direct the incoming text to the editor or a file. It uses all the Maclike features which make learning a new program easier: pulldown menus, text windows, scroll bars, the works done on the text scre-en using mousetext characters. A "help" command is available for most situations. The full-screen editor is responsive and easy to use, and with its 32,000 character capacity is really a mini word processor. You can insert text at any point, even change the line length for the entire document. (You must manually issue a "fill" command which reformats the entire document).

The program shows good attention to detail at every turn. Type an illegal space in a file name and MouseTalk supplies a legal dot in its place; key in an existing file name and it highlights it in your selection window. And what a joy it is to see all the file commands available within the program: Catalog, Rename, Delete. Hats off to USI. MouseTalk performs with a level of snap and speed which can only be accomplished by much careful low level hand coding and optimizing. If you use a mouse, you'll probably want this modem program.
Price : $69.00 | Code : S2U1MT | Wt. : 2 Lbs. |

MOUSEWRITE

from Roger Wagner Publishing
Apple IIe (enhanced),IIc,IIGS, ProDOS

MouseWrite has matured greatly since its introduction nearly two years ago. If you are contemplating purchase of a mouse for your //e or //c, or will be upgrading to a GS, and like the look and feel of Macintosh programs, give this one a close look. It's all there via the use of Mousetext characters: windows, menu bars and scroll bars, the entire desktop metaphor is constructed.

MouseWrite includes all the usual word processing features as well as accessories for telecommunications (300 baud only with Super Serial card or equivalent at press time), simple mailmerge, and spell checking. The spell checker, by the way, seems to offer better than average alternatives to the misspelled word. Most major functions can be performed using either the keyboard or the mouse. Most people find a natural transition between command selection entirely by mouse to greater dependence on the keyboard equivalents over time. The beauty is that the choice is yours! The separate tutorial and reference manuals also span the needs of starters to old hands.

MouseWrite benefits from large memory cards configurable as ProDOS RAMdisks (384K or greater required). The extra memory lets you open multiple documents simultaneously, a boon for fast cutting and pasting. If you have 500K of ramdisk space, the spell checker can run much faster out of memory than floppy disk. The use of a hard disk can also improve speed of operation. Printer support is good, including provision for a custom printer setup. Also supports color printing and fonts on the Imagewriter II. When you consider all the features you would need to pay extra for when purchasing most other word processors, MouseWrite is an excellent value.
Price : $119.00 | Code : S2R6MW | Wt. : 2 LBS. 8 oz |

REPORTWORKS

from Megahaus

AppleWorks is great but let's face it, it has its weaknesses and one of these weaknesses is the report generation capabilities of the database Reportworks comes to the rescue in grand style. It is a powerful report generator that allows you to create just about any type of report you could dream of using not just one file, but multiple AppleWorks files, both database and spreadsheet! With Reportworks you can fill out any form, including invoices and purchase orders, calculate and print estimates and proposals and much, much more. In effect, Reportworks gives Appleworks relational capabilities. Pull information from a database file, combine it with information from another database file and combine all of that with more information from a spreadsheet file

- Looks and feels like Appleworks.
- Flexible and easy to use.
- Built-in mathematical functions.
- Calculates tax.
- Allows for title and summary pages.
- Adds relational database capabilities to Appleworks.

Requires an enhanced 128k Apple IIe or Apple IIc
Price : $89.00 | Code : S2MDRW | Wt. : 11 OZ. |

SIDEWAYS 2.0

from Funk Software
II+,IIe,IIc
(As of this writing, Sideways is not fully supported on IIGS, it will work with a Parallel or Serial card in one of the slots however, but will not recognize external memory cards. Funk Software expects to have a working version by 2/1/87 with free upgrades.)

Sideways has been around for a long time now, but for the uninitiated, it lets you print your w - i - d - e spreadsheets "sideways" on your standard sized printers. Sideways now prints any DOS 3.3 text file, ProDOS text file, as well as AppleWorks spreadsheet files directly. Printing spreadsheets using Sideways is just like working from within AppleWorks with familiar menu styles and "Open-Apple" commands. Sideways works with most printers and interface cards and includes instructions for those not in the list. Other features include:

- Choose from six different font sizes from tiny to extra large.
- Select singe or double density printing.
- Adjust margins, page size, line and character spacing
- Works with most spreadsheet or word processors.

Price : $49.00 | Code : S2F2SW | Wt. : 2 LBS. |

ORDERING CHECKLIST

To speed all orders, please include:

1. Your Name as it appears in our records (same as on your mailing label).
2. Member number and expiration date.
3. Complete STREET ADDRESS (**not** Box number — see explanation below).
4. Phone number to reach you by day if we have questions.
5. Payment Including:
   Handling charge if applicable
   Domestic or Foreign Shipping Charges
   Magazine Postage if applicable
   (Sorry we do not accept COD or Purchase Orders on individual memberships.)

Each item you order needs:

6. Complete product name (and version if there is more than one product of that type). Specify computer model you are using.
7. Product Code

SHIPPING ADDRESS: We normally ship products by United Parcel Service (UPS). Therefore, the shipping address on your order cannot be a post office box. You may specify a P.O. Box for orders weighing less than 8 ounces. You also may make special arrangements for shipping some items via US Mail, Air Parcel Post, or UPS Second Day Air.

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4 "	6.00	8.07
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6 "	7.50	10.43
7 "	8.50	11.61
8 "	9.50	12.79
9 "	10.50	13.97
10 "	11.50	15.15
11 "	12.50	16.33
12 "	13.50	17.51
13 "	14.50	18.69
14 "	15.50	19.87
15 "	16.50	21.05
16 "	17.50	22.23
17 "	18.50	23.41
18 "	19.50	24.59
19 "	20.00	25.77
20 "	21.00	26.95
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FOREIGN SHIPPING CHART

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16-20 oz.	3.99	6.28	8.57
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THE BEAGLE COMPILER

NEW! COMING DEC. 1

$74.95 (for any Apple II–64K min.) / by Alan Bird

Machine-Language Speed for Applesoft Programs

Boot THE BEAGLE COMPILER and then run practically any Applesoft BASIC program from disk. The program will be converted on the spot, in seconds, to run at machine language speed.

HOW FAST IS IT?

It depends on your original Applesoft program. 5- to 7-times speed is about average. 10-times speed–and up–is not uncommon.

HOW EASY IS IT TO USE?

Say you've got a normal (slow) Applesoft program on disk named "ABC". Simply type RUN ABC and, within seconds, ABC is running at machine language speed!

It's just that easy.

If you want, make changes to your program (using Applesoft) and immediately re-run it at machine language speed.

"Beginning programmers love it. Experts are amazed."

IT'S QUICK!

Compiling takes only a few seconds (more or less–it depends on a program's size).

EFFECTIVE

Most programs compile without alteration. Syntax errors, illegal GOTO's, and so on, are automatically trapped before a program runs.

COMPACT AND CONVENIENT

A compiled program actually occupies less memory than its Applesoft original. You can even save in compiled format so people can't read or change your original Applesoft code.

PRODOS BASED

Compile Applesoft programs from ProDOS floppy disks, hard disks or Unidisk 3.5's.

Like all Beagle Bros software since 1980, The Beagle Compiler is not copy-protected.

BEAGLE SCREENS

NEW!

$34.95 (for any Apple IIe, IIc or IIGS)
by Fred & Sara Crone, Matt Reimer, Bert Kersey and Rob Renstrom

Choose from a dozen caption typestyles to give your messages variety. Beagle Screens is compatible with Font Mechanic fonts too.

BEAGLE SCREENS will get your message across–anything from "Happy Birthday" to "Hands Off"– in a unique and colorful way. Use our pictures to add a touch of class to your Apple programs or presentations.

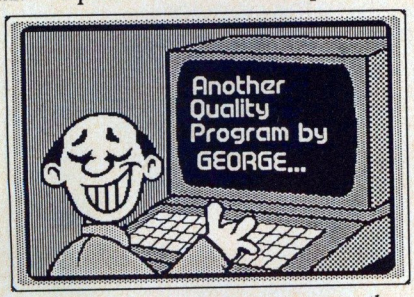
Or just use them to show off your Apple.

You get forty captionable full-screen pictures on disk (samples shown here). Half of the pictures are automatically animated as soon as you put them on the screen.

Each picture has a blank area (or "balloon") where you can add your own message.

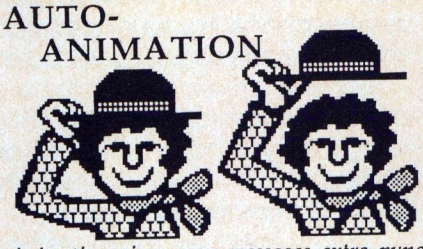
We make it EASY to add your own words and create colorful on-screen "slide shows".

Or print the pictures up as unique signs. (Printing requires a dot matrix printer and any standard printer software like Triple-Dump.)



It's easy–just type the message on the screen, and save the picture on disk.

AUTO-ANIMATION



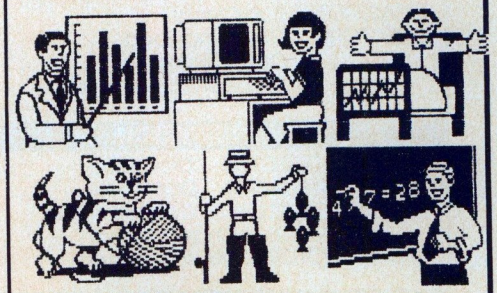
Animation gives your messages extra punch. Twenty Beagle Screen pictures are automatically animated as soon as you load them onto the screen.

MINIPIX DISK #2

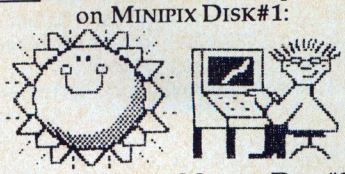
NEW!

$29.95 / by Fred & Sara Crone

MINIPIX DISK#2 is 200 pictures–ALL NEW and ready to use with THE PRINT SHOP™:



Plus–You'll find 200 more pictures on MINIPIX DISK#1:



Coming soon: MINIPIX DISK#3 and Minipix for THE NEWSROOM.™

TRIPLE-DUMP

$39.95 (for any version of Apple II)
by Mark Simonsen & Rob Renstrom

TRIPLE-DUMP combines with your dot-matrix (graphics-capable) printer and any Apple II to print:

- Hi-res graphics
- Lo-res graphics
- 40-column text
- Double Hi-res graphics
- Double Lo-res graphics
- 80-column text

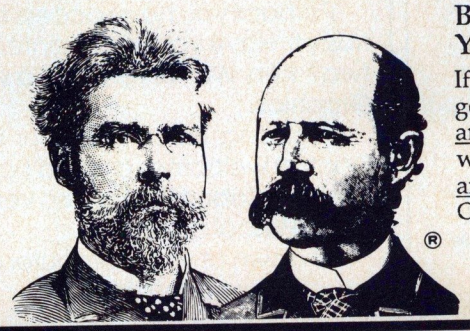
Make "hard copies" of all kinds of images with absolutely no programming knowledge.

Or, if you're a programmer, use Triple-Dump's routines in your Applesoft programs.

Triple-Dump offers picture cropping, rotating and magnifying, plus the ability (on many printers) to adjust the print density.

BANNERS!

Print giant (8"-high letters) text banners on any printer. Great for special occasions!



BUY BEAGLE PRODUCTS AT YOUR SOFTWARE STORE.

If your dealer is out of a particular disk, get on his case. Tell him he can have any of our products in his store for you within a couple of days by contacting any major Apple software distributor. Or by phoning Beagle at **619-296-6400**.

Or you can order by mail (we ship fast!):
Call Toll Free (orders only–Mon.-Fri., 9am-4pm Pacific time):
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Visa, MasterCard or COD(or mail a U.S. check).
Add $2.50 shipping ($5.00 if overseas)
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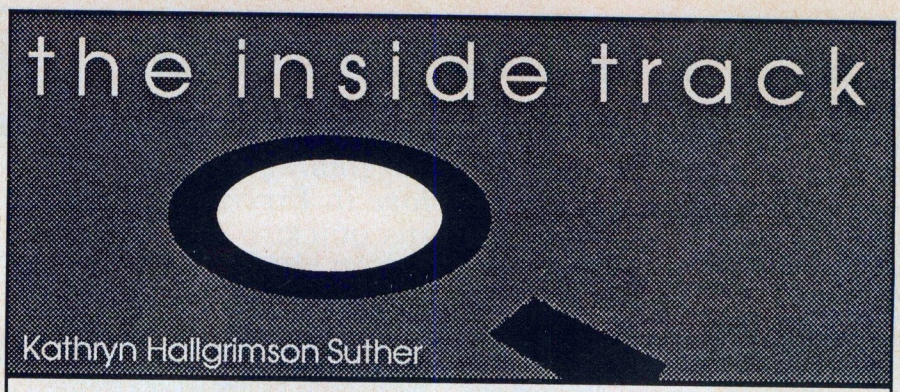

Kathryn Hallgrimson Suther

in the lead:

Word processing has been around for years , it's just the programs and methods that have changed. In his first of two installments entitled **Three New Approaches to Word Processing**, Marc Apfelstadt takes a look at three popular programs: MultiSribe, Bard's Pro-Am, and MouseWrite. In his second review we look forward to an examination of the new version of Bank Street Writer (Bank Street Writer Plus), Manuscript Manager, Sensible Speller, the revision of Word Perfect (1.1), HomeWord Plus, Paper Clip)(e and AppleWorks add-ons. So, keep your eyes on this column, we're sure you'll find something of interest.

and... close behind:

Cecil Fretwell "noses around the accessories" in his article **From IIe to IIGS and Beyond.** If you're contemplating purchasing a GS or you're simply interested in this new computer, this inside look is for you.

Bob Bishop continues his assembly series in **Modular Assembly Language Programming Part II: A Musical Fanfare.** Bob shows us how to how to generate a 3 note chord and then several chords in sequence (a complete piece). Now, adding music to your programs will be a snap.

Have you ever wanted to be able to easily transfer a program or datafile from another disk onto the disk you are currently using? Did you have to stop what you were doing to use ProDOS utilities? Steven Ohmert makes life easier for us in his article **A COPY Command for ProDOS.**

Jeffrey Jacques continues his discussion of spreadsheet macros in **Working with Macros Part II.** In this installment, Jeffrey illustrates the use of spreadsheet macros while running a small business. Anything to make our jobs easier, right?

Perhaps you have access to a Macintosh along with your trusty II. Have you ever wanted to pass grpahics between the two? Ken Watters gives us a solution in **Please Pass the Graphics.**

In closing, Bruce Field (our long time and loyal A.P.P.L.E. Doctor) welcomes a friend's contributions to this popular column. **Robert Platt** is also versed in Pascal, so please send in those Pascal questions.

Sit down at your computer now and word process or program to your hearts delight!

MEMBER BILLBOARD

February 1987

Announcement of Annual Elections

The annual elections of officers for A.P.P.L.E. Co-op will be held:

Tuesday, March 17, 1986 • 7:30 P.M.

A.P.P.L.E. Co-op Headquarters
290 S.W. 43rd Street
Renton, Washington 98055

Please attend if you can. If you cannot, please fill out the mail order ballot which will be mailed to early in February.

Subscription Changes

There have been a number of inquiries concerning changing a members ' subscription from one of the magazines the Co-op publishes to the other. In the past, we have tried to accommodate all these requests when we received them. However, due to the problems this creates with accounting, operations, and the mail room, we are now forced to place restrictions on when a member may change their subscription.

Subscription changes may now take place only when a member is renewing his/hers membership. However, there is no restriction on when a member may subscribe to an additional magazine besides the one they receive free with their membership. Simply send in the $15 subscription fee for the additional magazine, and you will be receive both *Call-A.P.P.L.E* and *MacA.P.P.L.E.*

The Catalog

We are currently about seventy five percent finished with the catalog. A project such as this requires a tremendous amount of coordination among the departments within the Co-op. The holidays, the effort to catch up on our magazine publishing schedule, and the trade shows, have impacted our publication schedule for the catalog. However, the end is in sight. You should be receiving the catalog soon.

New Customer Service Line

We have just opened up a new customer service line: **(206) 251-9798.** If you have a question concerning the status of an order, this is the place to call. The customer service line will not handle product information calls. We have the hotline for that purpose.

When calling customer service, please be as brief and succinct as possible. This will keep your phone bill from going through the roof and will allow us to answer your question and quickly move on to the next member's problem.

You will notice that the customer service line is not a toll free line. In order to offer you quality products at a reasonable price, we need to keep costs down while maintaining the high level of service that is your right to expect.

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Membership Information: available on postpaid tear-off card inside.

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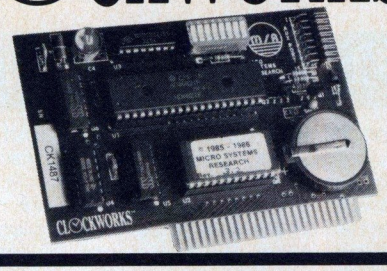

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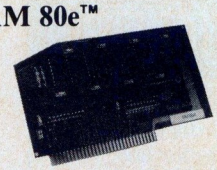

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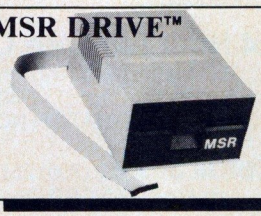

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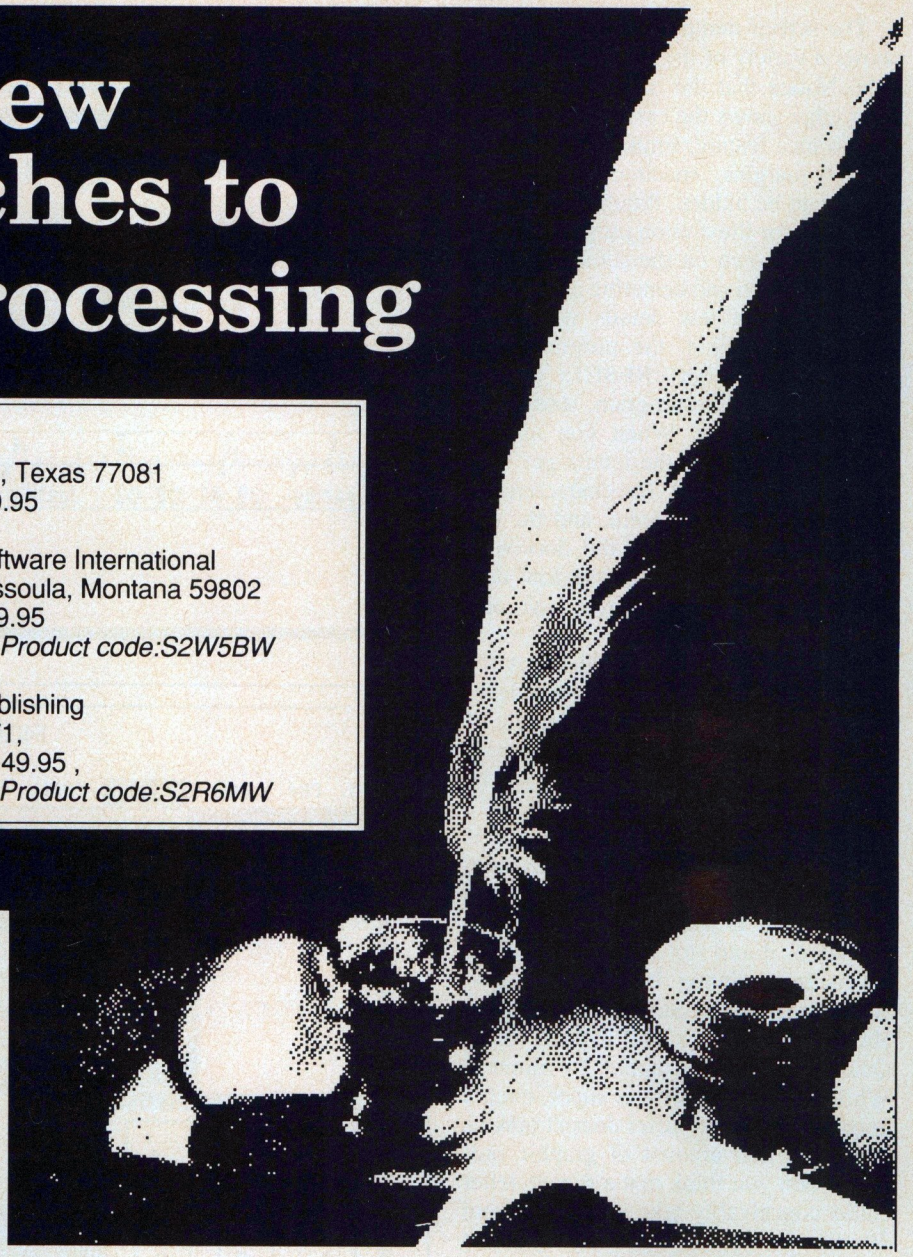


Marc Apfelstadt

Word processing has changed tremendously since the early days of the Apple II. My initial experiences involved EasyWriter, 40 columns with no lower case (upper case was shown in inverse), running on a 48K Apple II. As hardware capabilities have expanded, software has been able to evolve in a number of different directions. This allows each of us to seek out a word processor which fits our own needs and personality, not just the "best word processor" by someone else's definition.

I would like to examine three of the 'new crop' of programs in detail: MultiScribe (version 2.0), The Bard's Pro/Am (ProDOS), and MouseWrite (version 2.6.8a). Let me mention up front that I have served as a beta tester for two of the three products.

Rather than giving me a bias, the long term experience with the programs has increased my perception of their strengths and weaknesses. The comments offered are based on a detailed knowledge of the products. I didn't just break the package seal, play with it for thirty minutes, and then attempt my review!

All three products are supplied in unprotected format, and are hard disk and 3.5 disk compatible. Each requires a 128K enhanced IIe or IIc, and represents a good value for the price, with regard to the features provided.

MultiScribe

Let me begin with MultiScribe, from *StyleWare*. The program is implemented with double hi-res graphics, and it draws heavily on the Mouse/Mac interface. Keyboard commands emulate most of the available menu choices, so you can work from menu choice or typed commands. Variable fonts are the strong feature, and when you change size or style, your changes appear on screen. There is support for RAM disk software, and it speeds up operation considerably for some of the program segments.

The programming is very slick, and the screen display is cleanly drawn. One document can be open at a time, and you have a great deal of flexibility with mixing of typefaces. The new version contains an Accessory Manager, which gives access to additional programs, also available from StyleWare: Picture Manager, Accessories, and a Speller. If you have seen or worked with earlier versions of this program, you'll notice the improved ProDOS interfacing in version 2.0.

Printer options have also had an overhaul, and you can choose from 7 options that range from Near Letter Quality through Draft and on screen display. Preview Page range printing is now supported, and you can select new fonts for the font list from within the program. The program also prompts you to save the file before exiting, if you have not already done so.

The screen dump shown in Figure 1 shows a variety of the print styles available. Notice that the 'side ruler' on the right edge shows the current page number—a nice feature. Embedded rulers to change margins, spacing, and justification can be hidden, though this one is displayed for illustration purposes. Type styles are shown on the screen display, but justification and centering are not.

There are a few details which are worth noting. First, the program, like AppleWorks, is not <RESET> protected. If you lose the program, start again from a cold boot. When you use an expanded type size, the letters get very blocky in appearance. The characters are drawn on a matrix system, and the expanded versions replace the dots with drawn blocks. Because of the font definition process, there really isn't any way to avoid the problem.

The program used double hi-res for the display, and it is quite possible to overtype in insert mode in the middle of a page. Screen refresh just can't keep up with touch typing, so it helps to slow down a bit.

The real limitation to MultiScribe is also the program's greatest strength. Since the characters are graphically based, printing is handled as a dot addressable dump to the printer. This means that printing is *extremely* slow. A single page in Standard style takes about 3 1/2 minutes, and in Near Letter Quality mode takes about 14 minutes. While the print quality is super, even a good sized printer buffer doesn't make a dent with that amount of graphic output. When you think that a 6 page letter could conceivably take anywhere from 20 minutes to an hour and a half to print, the usefulness is somewhat diminished.

For custom graphics, take note: the Font Editor provided with the system is very flexible. Figure 2 shows the Editor screen. Notice that as you modify the character, the various type styles supported in the program are also illustrated.

The Accessories are scheduled for release during February. Picture Manager ($39.95) allows you to clip portions of pictures and use them in your documents. The program operates by converting the picture segment into a MultiScribe font file, and leaves it placed on the clipboard. Pasting into your document places the picture.

There are two slight limitations. First, an entire screen will not fit into a MultiScribe file. The other problem relates to the font creation process. The picture is imported using maximum font dimensions. This means that text in the picture area goes to the base line of a large font space, even if a small font is chosen. In spite of these wrinkles, the capability is very useful. The Speller and Desk Accessory utilities were not available at the time this was written, but they should be out by the time this appears in print.

MultiScribe is reasonably priced, fun, and extremely useful in preparing posters, handouts, overheads, and display materials where the quality is crucial. As for personal and professional correspondence, you need to decide whether the printing process takes too long to be practical.

To their credit, the people at StyleWare have taken this product through a *tremendously* evolutionary process since the release of 1.0. They are truly committed to improving the product and supporting their installed base of customers. Registered owners of earlier versions can upgrade to 2.0 in one of two ways. If you send $13.00 ($10.00 + p&h), StyleWare will ship you the new disk and and an Addendum for your manual. $23.00 will obtain a copy of the new manual in addition to the disk update.

FIGURE 1

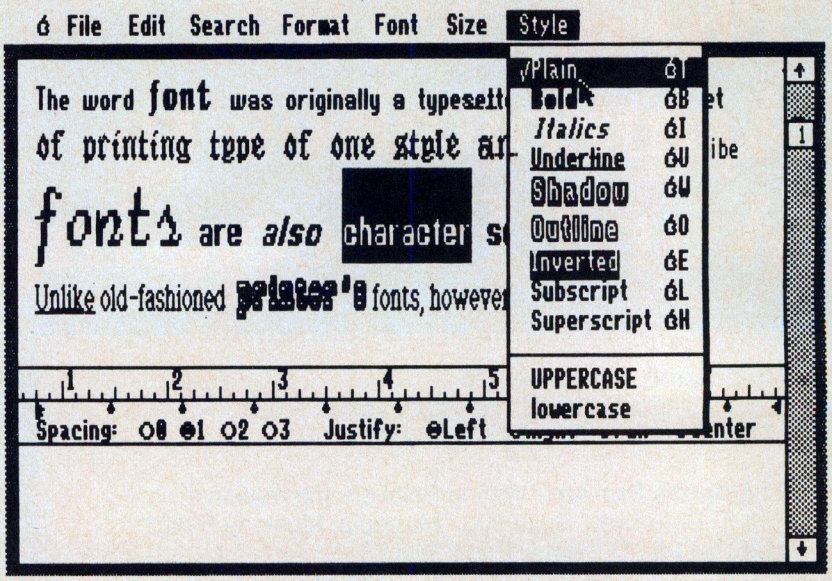


FIGURE 2

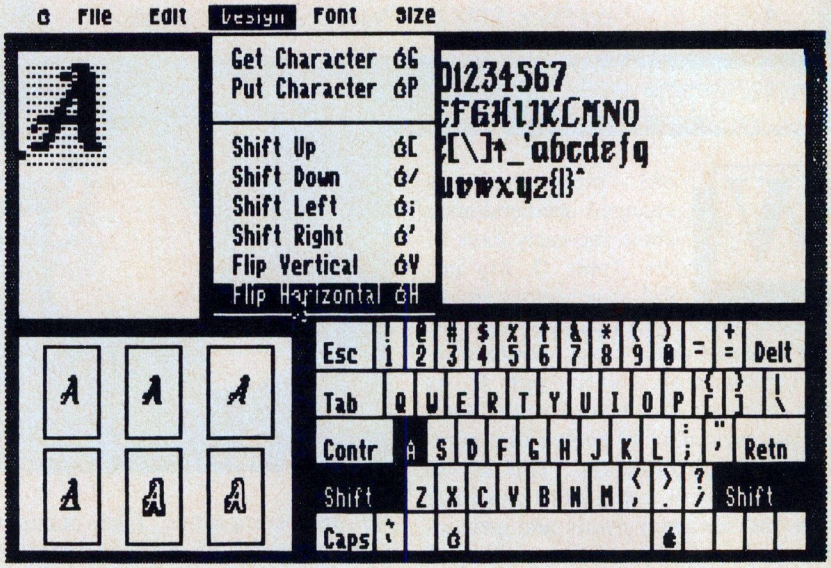


FIGURE 3

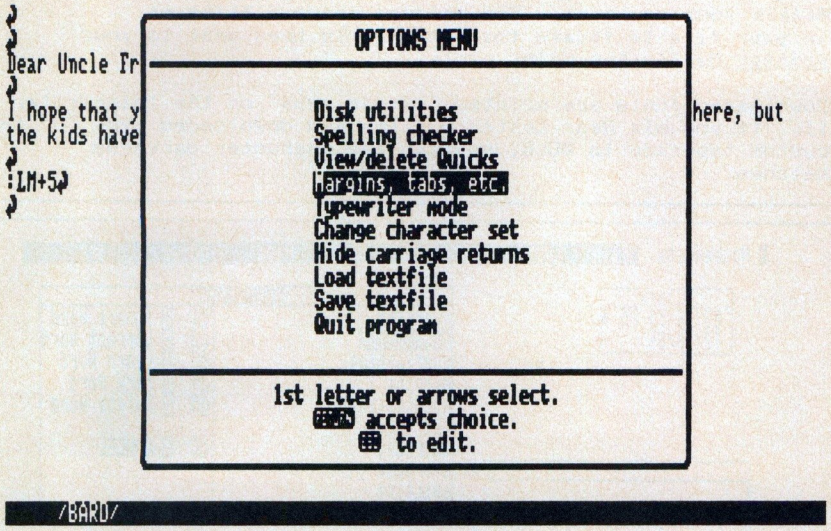
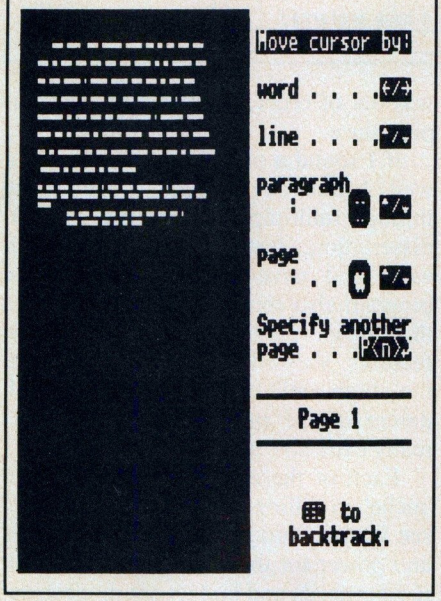


FIGURE 4



Bard's Pro-Am

The Bard's Pro/Am, from *Writing Software International*, actually provides four different configurations of word processing for your use. Each level adds commands and flexibility, so you can step up in complexity as your grasp of the program expands. The program is <RESET> protected, and contains a built-in spelling checker with a 50,000 word dictionary.

Screen display is handled primarily with double hi-res, and there is no Mouse support provided. As with MultiScribe, it is possible to overtype the screen display in Insert mode at times. Cursor moves are controlled by Arrow keys, and the menu choices are drawn from the top menu, which is triggered by pressing <ESC>. Figure 3 shows the Bard with the Options menu active.

In many ways, this has the feel of older program technology, even though it uses double hi-res display. Commands are virtually all triggered by Control Key combinations, and embedded printer commands take up separate screen lines, followed by a <RETURN>. The <ESC> key 'backtracks', in Bard terminology, backing out of to the next level of the command system. If you're comfortable with Control Key commands from GPLE, for example, this program will feel quite natural to you.

There is a Macro capability, in the form of 'Quicks'. These files can contain up to 15 entries of 255 characters each, for use in installing printer options or common phrases. They are saved to disk for later use, and retrieved when called. Since you type in your text in 40 or 80 column mode, there is a View Page feature which shows the effect of formatting on a graphic display. Figure 4 shows that page in action.

The built-in speller is quite serviceable. You need to save your document before using it, though, in order to preserve your most recent editing. There are a few other minor shortcomings in the Bard's operation. Menu lists don't scroll around, when you reach the bottom, you need to go back with the Up Arrow to reach the top. Menus do respond to 'first letter' to select an option, although that's probably the preferred mode. The program also supports only single and double spacing, with no provision for triple spaced text.

I like the Bard, and it has quite a 'comfortable' feel at all of the various levels. Of course, there aren't *really* four different programs. Actually, there are four versions, with various sets of commands stripped out. The concept works well for learning the system, though.

The documentation is not quite as satisfactory as the actual program. A small (1/2 size) User's Manual presents the information clearly, but in paragraph form. It is easy to get lost on the page while working through examples, since there is very little variation in typeface on any given page. The actual content is OK, but point form or separate small sentences might have been much easier to follow. There is a command glossary at the end of the manual, but it is also in paragraph form, so you really need to look to find the answers at times.

As a low-priced, flexible program, the Bard could easily meet your needs for home or personal word processing. The ProDOS file interface is very easy to grasp, and the program operates smoothly and without errors.

MouseWrite

MouseWrite is by far the most elaborate and powerful of the three products examined, but then, it is also the most expensive. The program uses a Mac-like window environment, implemented through MouseText characters in 80 columns. It is supplied on 5 1/4 and 3.5 disks, with production labels for your backup disks.

The initial release of the program almost two years ago was basically a barebones product, but the new version features a host of enhancements. The product is now full of features and suit-able for heavy duty word processing. On screen, you see a document window, ruler above for margins, and pull down menus from the top line of the display. As with MultiScribe, most commands have keyboard equivalents for selection.

In addition to basic word processing features, the program contains a Desk Accessory set of utilities which implements Communications and a 62,000 word spelling checker available from within your document. You can even exit to BASIC, run another program, and return to MouseWrite with a BYE command, if your program uses only the main 64K bank of memory.

There is a complete mail merge facility, with the capability to use both

insert and overwrite modes. Therefore, formatted form letters and filled invoices can be handled with equal ease. Macro commands are available, through the Glossary command. There isn't an 'auto-record' mode, so they need to be set up manually as text files. The files can be easily created and saved to disk. Print formatting is completely flexible, and 'mousing' is a breeze. Since the 80-column text screen is used, it is virtually impossible to overtype in insert mode.

If you have a supported printer and interface combination (ImageWriter, Pro-Writer, Epson FX,JX,EX), you can download custom typefaces to the printer *during* your printout, and use them in combination with the normal type face, as shown in Figure 5. Any one line can contain a downloaded font mixed with normal text. You can print just the 'mouse selected' text, and, if you have an ImageWriter II, you can also tell the printer to do text in a specific color! Otherwise, the color commands can be redefined for your own use.

MouseWrite reads and writes text and MouseWrite files. It will also read in and interpret AppleWorks files without modification, and can import DOS 3.3 text files directly. (No need to convert them in advance.) One caution for that option: if your file contains hidden control characters, they may do funny things! Once it is loaded, save it as a 'For Other Word Processor' (text) file, which removes the characters, then reload it for editing.

The real power of MouseWrite comes as your hardware begins to expand. If you have a RAM card, the program can load all of the system and overlay files into memory , including the dictionary. This makes operation exceptionally quick. When expanded memory is used, MW will allow you to do background printing of your document, while you edit another, and allow up to *twelve* open documents at once.

There are a few little quirks to the program operation. As with AppleWorks, control characters for print formatting occupy line positions. The Right margin is set for the entire document, so inset paragraphs (both left and right margins) need RETURN characters at the end of each line. Moving the right margin involves recalculating the page formatting throughout the document-in a long one, this can take quite a while. Footnote support is provided, but you must handle the numbering yourself. The text is moved to the bottom of the page automatically.

FIGURE 5: MouseWrite downloaded fonts

With MouseWrite, you can mix custom fonts,
Within your document. The program reads a **Pathname**
in your file to locate the font. It is then sent to your
printer during the print cycle.

Downloaded fonts are printed 'single pass' on the ImageWriter
II. If you mix Near Letter Quality and downloaded type, do the
custom typeface in **BOLD**, so that the character darkness
matches.

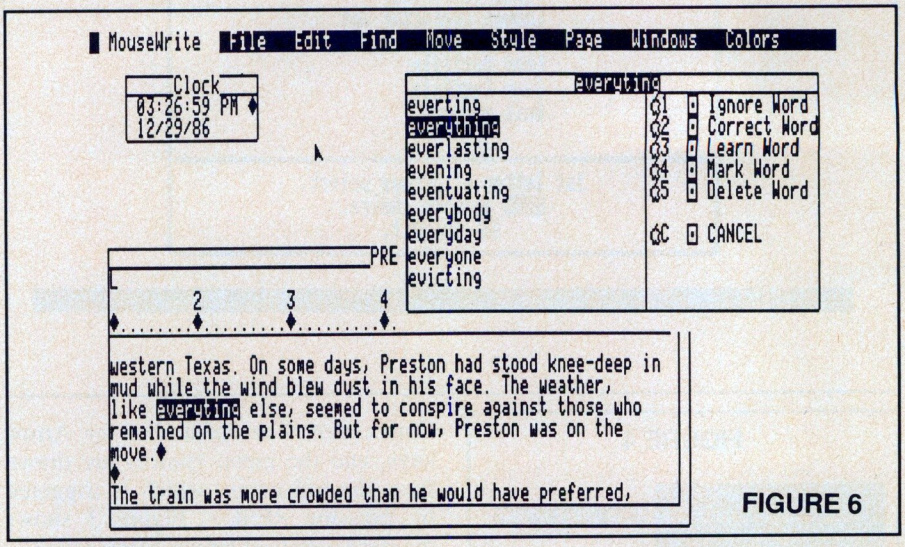


FIGURE 6

Windowing is almost totally flexible, as Figure 6 shows. I normally operate with the clock displayed, and a smaller document window below. When you use the Speller, it is possible to create a small document window and move the Speller to another area. That way, the Speller doesn't overwrite the error it tries to show.

The Spell checker supports a USER file, so you can add words as needed. From floppy, the Speller is a bit slow, but in RAM, it sails along. When you get really curious, the About MouseWrite selection reveals your number of lines, size of document, number of words, and approximate reading level of your text!

Frankly, MouseWrite is protected against errors and <RESET> better than any program I've ever run across. In the interest of testing, I've tap danced on the <RESET> key during a 'Close All' function with 12 open documents on the desktop (not recommended!), and recovered to the Save screen with no ill effects.

The documentation is clear, and the tutorial is fun to work through. I recommended MouseWrite to a friend who was giving up on two different wordprocessors in frustration. After setting up the system defaults, I told him to call if he had problems. Two weeks later, I checked to see if his phone (or mine) was out of order. He's been up and running since.

If I sound a bit sold on the program, well, I must admit I am. It carried me through multiple drafts of my doctoral dissertation, handled formatting with ease, and never missed a beat. The program also comes *with* the accessories that other publishers sell as add-on features. Viewed in that light, and given the high reliability and 'crashproof' nature of the program, the price isn't really excessive at all.

Each of these programs has its own 'niche' in filling needs for users. As I see it, the Bard offers a lot of features and power for the dollar. Give it a look if your needs and budget are modest, especially if you prefer keyboard driven software. MultiScribe gives a superb graphic output, and I use it heavily for presentation graphics, and posters. If the slow print speed doesn't concern you, the flexibility is incredible. MouseWrite combines power, formatting ease, and accessories into an integrated environment that is hard to top. No matter which you select, you'll be satisfied!

Please rate this article on the Reader Service Card by circling:

51 Excellent **52** Good
53 Fair **54** Poor

From IIe to IIGS *and Beyond*

Cecil Fretwell

A little over four years ago, I proudly carried my first Apple II+ home. It had the full bore 64K and I was happy as a lark because the II+ was certainly a monster compared to my home brew 8K system. A few months later, I was lucky to trade the II+ for the IIe and ended up with 128K in the bargain. My wife wanted a computer so along came the really neat and portable IIc. Very soon Apple sold me the chip set to improve my IIe to the enhanced IIe. By then, I thought life was complete until out came the IIGS. I was hooked again and really wanted Woz's autograph so I hounded my dealer until he practically had to fly to California and pick one up.

Why all this history? The Apple series of computers is just one example of how computers have become smaller and smaller in physical size, lower in price, yet more powerful than previous models. My enhanced IIe has a mouse, a Super Serial Card, a Prometheus VersaCard, two old Disk][drives, and a 3.5" drive. My total investment is over $4,000. My IIGS is the same as the IIe except that the IIGS has only one 5 1/4" drive and 1 megabyte of memory. All this for less than $2,500.

Ok, let's take a look at this marvelous new beast. Before I received my IIGS I knew I was going to prepare an article of this nature. Therefore, I only scanned IIGS articles prior to this because I wanted to attempt to present my own first impressions of the system.

The system came in four boxes, (1) the CPU unit, (2) the RGB Monitor, (3) the 5 1/4" drive, and (4) the 3.5" drive. It took me about 45 minutes to uncrate everything and make sure nothing was missing. If you are worried about connecting together all the pieces, the system comes with an excellent "Setting Up Your Apple IIGS " manual. After another 15 minutes required to hook everything together, I fired up the system with one of my standard 3.5" disks from the IIe. I was not surprised when the system came up with no problems.

With the system up, I first invoked the ROM based Desk Accessories using the CONTROL-OPEN APPLE-ESC combination. This displayed a screen with the following three options:

```
Control Panel
Alternate Display Mode
Quit
```

with the word "Quit" highlighted. Typical of all panels in this mode, moving to the desired choice is accomplished by means of the up and down arrow keys. After moving to a desired option, pressing the RETURN key selects the option resulting in an appropriate panel.

Almost all of what is to follow is the result of nosing around in the accessories by means of pressing keys based on screen information and using my head. In a few cases, I had to look at the manual to obtain necessary details. The point is, the IIGS appears to be user friendly right out of the box and one does not really have to spend hours reading a manual.

According to the manual, the Alternate Display Mode option allows one to run old II applications using the old II method of displaying characters, graphics etc. If the old mode is not required, Alternate Display Mode provides the ability to use the new display techniques.

The Control Panel is just what it implies. Through it, one configures the system to support their mode of operation. Its initial display is

```
Display
Sound
System Speed
Clock
Options
Slots
Printer Port
Modem Port
RAM Disk

Quit
```

with a continuous clock display of time and date in the upper right hand corner.

Selecting the Display option brings up the following panel:

```
Type:                   Color(Color or Monochrome)
Columns: 40             (40 or 80)
-Screen Colors-
Text: White             (Various)
Background:MediumBlue   (Various)
Border: Medium Blue     (Various)
Standards:              Yes
-Hertz: 60-
```

The comments in parentheses are not on the screen. They represent my comments as to the various choices. If any particular line begins with a check mark, this indicates the default or recommended parameter for an option.

In this and other panels, using the up and down arrow keys moves from option to option, i.e., up and down lines on the screen. When a particular option is highlighted in reverse video, using the right arrow key moves forward through the possibilities, using the left arrow key moves backward through the possibilities. An option is selected by pressing the RETURN key. In all panels, using the ESC key causes any current changes via a particular panel to be ignored.

In this screen, the Screen Colors line is not an option, it is a header. Below it, various options can be tested to produce what you like for a background color and a foreground color, i.e., text mode. If you select a text, background, or border color other than the standard, the Standards line will show NO. If this line shows YES, you select it, and press RETURN, the system crashes. You must reboot. If the Standards line shows NO, selecting it and toggling to YES followed by the RETURN key causes the defaults to be taken.

Selecting the Sound option brings up the following panel:

```
Volume:  |-----*----------|
Pitch:   |------*---------|
```

After selecting an option, using the right and left arrow keys allows you to change the volume and pitch of the bell sound or other sounds. In my initial playing around, I used it to try to improve the "sick" sound of the bell. I am an old traditionalist and like my friendly IIe beep. Although the IIGS bell sounds like an out of tune key on a piano, I can more than live with it considering the power I now have.

Selecting the System Speed option brings up the following panel:

```
System Speed:        Fast(Fast or Normal)
```

Normal is the 1 Mhz speed of the previous II series. Fast uses the 2.8 Mhz speed.

Selecting the Clock option brings up the following panel of the form:

```
Month: 11
Day: 13
Year: 86
Format:      MM/DD/YY (MM/DD/YY
             or /DD/MM/YY or YY/MM/DD)
Hour: 5 PM
Minute: 18
Second: 42
Format:      AM-PM (AM-PM or 24 hour)
```

with a continuous running date and time in the upper right hand corner. This is the panel used to set the date and time for your system. By the way, ProDOS 1.1.1 does not recognize the IIGS clock. So if you have a disk with ProDOS 1.1.1 and you want to use it on a IIGS, copy the ProDOS module on the Systems Disk (to be covered later) to your disk. I like this panel because gone are the days requiring special code to adjust the clock for the ThunderClock, the VersaCard, etc.

Mentioning a disk brings up a point. All software comes on a 3.5" disk. There is an Apple IIGS System Disk and a "Your Apple Tour of the Apple IIGS " disk. This makes it rather difficult to use the system if you choose to save money by purchasing only a 5 1/4" drive. I recommend the 3.5" disk drive because the industry is rapidly headed in this direction. I also purchased the 5 1/4" drive to provide for backing up systems, copying disks, etc.

Selecting the Options option brings up the following panel:

```
Display Language: U.S.A.          (Various)
Keyboard Layout: U.S.A.           (Various)
Keyboard Buffering: No            (Yes or No)
Repeat Speed:   |---------*-------|
Repeat Delay:   |---------*------|
Double Click:   |---------*------|
Cursor Flash:   |---------*------|
-Advanced Features-
Shift Caps/Lowercase: No          (Yes or No)
Fast Space/Delete Keys: No        (Yes or No)
Dual Speed Keys: Normal           (Normal or Fast)
High Speed Mouse: No              (Yes or No)
```

The display language and keyboard layout allows for various foreign countries such as French, German, etc. For a fast typist such as myself (typing was the best course I took in high school), the IIGS incorporates a feature available on many systems such as the ones painted blue. To demonstrate it, consider SAVEing a file to disk under AppleSoft control. During the SAVE process on the pre-IIGS systems, pressing a bunch of keys did not blow the system's mind.

The last key you pressed appeared right after the normal] prompt character. On the IIGS, you can have this same situation or enable keyboard buffering. Enabling keyboard buffering means that every key you press during the SAVE process is remembered and displayed after the SAVE process is completed. Some people call this the type ahead feature.

If you hold a key down long enough (the Repeat Delay option), it will repeat at a specified speed (the Repeat Speed option). The Double Click option adjusts the speed between clicks on a mouse. Setting this at a high speed means you must be fast in pressing the key twice called (double clicking). The Cursor Flash option determines how fast the cursor blinks.

The Shift Caps/Lowercase option has to do with the CAPS LOCK key. With this key down and No for this option, no matter what you do with a shift key, upper case letters remain upper case. With Yes for this option and the CAPS LOCK key down, a shift key and a letter key produces a lower case letter.

The Fast Space/Delete Keys option set to Yes doubles the rate at which the space bar or Delete key repeats. For the Dual Speed Keys option, setting this to fast allows you to use the CONTROL key with a desired key to double the repeat rate. Finally, if you think you are good with a mouse, choosing a high speed mouse moves its pointer twice as fast for the same movement as obtained from a slow speed mouse. Since you automatically receive a mouse with the CPU, if you don't think you need it, give it a shot. I was one of the last in my office to begin using a mouse. Believe me, once you start using one, you will never be without it.

The Slots panel shows you the configuration of your system. It really shows you what is contained in each slot of your system. Without hardware cards in the slots, the "defaults" are

```
Slot 1  :  Printer Port
Slot 2  :  Modem Port
Slot 3  :  Built-in Text Display
Slot 4  :  Mouse Port
Slot 5  :  Smart Port
Slot 6  :  Disk Port
Slot 7  :  Your Card

Startup Slot: Scan
```

These are more or less the standards set down through the years of Apple. Notice the Smart Port in Slot 5. This is really the 3.5 UniDisk with its smart protocol. For example, the 5 1/4" drive I purchased is connected to the back of the 3.5 drive which is connected to the CPU box. Under ProDOS 1.1.1 and earlier, such a display could be obtained using a special STARTUP program supplied by Apple. If you place a card in a hardware slot, then this panel must be invoked to reflect the change in hardware.

This Slots panel also provides the ability to overcome a "problem" with the IIc containing a 3.5" drive. Connecting a UniDisk to a IIc causes that drive to be connected to Slot 5. If

APDA AD #3

from the
APPLE PROGRAMMER'S AND DEVELOPER'S ASSOCIATION

APPLE IIGS PROGRAMMING & DEVELOPMENT WITH APW

APDA now has *the* major development system from Apple Computer for the IIGS: the **Apple IIGS Programmer's Workshop (APW).** For just $100 you get the first version of APW, containing:

- the *command shell:* file management, directories, I/O redirection, pipelining, ProDOS16 extensions.
- *full-screen text editor:* works with languages and assembler letting you copy, move and delete, search and replace.
- *assembler:* produces 65816 programs that assemble to relocatable code, with full support for standard file formats, macros, library files.
- *linker:* generates load files from the output of the assembler and future languages.
- *debugger:* trace, step, insert breakpoints; display registers and memory locations, direct page and stack.
- *more:* utility programs, System loader, Memory Manager and summary of Tool Calls also included. Also note that TML Systems' new IIGS Pascal v. 1.0 runs under the APW environment.

The *IIGS Toolbox Reference, ProDOS16 Reference, Hardware Reference*, and *Firmware Reference* manuals are also available. *These products are for sale to APDA members only.*

ABOUT APDA

The Apple Programmer's and Developer's Association is a one-stop source for the Apple programmer, providing development tools and technical information from Apple Computer, Inc., and other publishers; for example:

- Apple II, IIGS, and Macintosh development tools, system software, technical notes, and manuals from Apple Computer.
- Languages, tools, and utilities from third-party companies.
- Apple-related and general-interest technical books.

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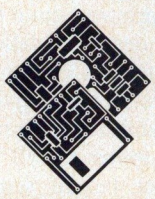

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CIRCLE **2** ON READER SERVICE CARD

you want to boot from a UniDisk in Slot 5, you have to leave the internal disk drive door open. On the IIGS, this pain is overcome. Via the Slots panel, you can specify the Startup Slot. By choosing Slot 5 for the Startup Slot, the system does not try the floppy in Slot 6 first, it goes directly to Slot 5 and boots from that drive. The default of scan means the system will start with Slot 6 and search its way down the slots until it finds a disk in a drive.

The Printer Port option panel allows you to set up a printer and looks something like the following:

Device Connected: Printer	(Printer or Modem)
Line Length: 132	(Unlimited, 40, 72, 80, 132)
Delete first LF after CR: No	(Yes or No)
Add LF after CR: Yes	(Yes or No)
Echo: No	(Yes or No)
Buffering: No	(Yes or No)
Baud: 9600	(From 110 to 19,200)
Data/Stop Bits: 8/1	(5/1 or 5/2 up to 8/1 or 8/2)
Parity: None	(None, Odd, or Even)
DCD Handshake: No	(Yes or No)
DSR/DTR Handshake: Yes	(Yes or No)
XON/XOFF Handshake:	(Yes or No)

The assumption is the printer port is Slot 1, however, the panel does allow you to call the port a modem. The panel does everything the switches do on a Super Serial Card. For the line length option, this specifies the number of characters without a carriage return before the hardware automatically supplies one. Choosing the delete first line feed after carriage return, suppresses the first line feed after a carriage return. This is for printers which automatically supply a line feed after receiving a carriage return. The add line feed after carriage return option causes the built-in software to automatically send a line feed after a carriage return. Software such as Apple Soft sends only a carriage return character to the printer and assumes hardware or software supplies the line feed.

The echo option used with the printer means every character sent to the printer is also displayed on the screen. Used with a modem, every character sent to the modem is also displayed on the screen.

An interesting parameter is the buffering option. To quote the manual, if this is activated, the buffer is a special holding area in RAM which holds information until the computer or peripheral device is ready to deal with it. The manual further states don't change this setting unless the manual which came with the device tells you so.

The IIGS printer port is a serial port, if you have a parallel printer, you will have to purchase some extra hardware. An external modem always uses the serial port. For either of these devices, consult the manual for baud rate, number of data bits, number of stop bits, and parity.

For the next three options, the manual is not terribly clear when it comes to constructing or connecting a printer or modem to a port. Especially true with a printer, an electrical signal or a special code sequence is used by the printer to temporarily stop the computer because the printer cannot keep up with the computer. The signal or sequence is called a handshake. For some devices, this handshake is electrically provided by Data Carrier Detect or Data Set Ready/Data Terminal Ready signals. For a software handshake, a printer may send the XOFF character to the computer to tell it to wait until it receives the XON character before sending additional data. Based on my cabling activities, it appears only one of these handshake options can be chosen, i.e., only one can be YES, the others must be NO.

The Modem Port option panel is an exact duplicate of the Printer Port.The only difference is, the defaults are different. The RAM disk option applies only if you have installed a memory expansion card. In other words, this option cannot be used to manipulate the standard memory shipped with the IIGS. This is not to be confused with the /RAM volume established by ProDOS when it boots.

The screen for this option typically shows:

Minimum RAM Disk Size	0K
Maximum RAM Disk Size:	0K
-Largest Selectable:	1024K
-RAM Status-	
RAM Disk Size:	0K
Total RAM in Use:	84K
Total Free RAM:	1195K

which is for a system with 1 MB of expanded memory. According to the manual, given expanded memory, the RAM disk you specify can be formatted, accessed by volume name, copy or save information, etc. The panel allows you to specify the minimum and maximum amount of space to allocate to the RAM disk. What you specify does not take effect until the next time you boot. More on this later.

At this point, I took a break and invited the wife to join me in "Your Apple Tour of the Apple IIGS ". This is a 3.5" disk which provides one with an extensive overview of the system. It starts out with a humorous five minute session involving the use of the mouse. To tell any more may rob you of some good laughs.

The tour continues via pull down menus to select topics. As you go through the topics, there are many graphics screens with appropriate sounds. These really show the true power of the IIGS and how it lives up to its name.

For the topics, you can pick and choose what you want to look at depending on your expertise. The following topics are available.

1. Keyboard Basics
2. Work Processing (Mouse based, not AppleWorks)
3. Data Base (Mouse based, not AppleWorks)
4. Spreadsheet (Mouse based, not AppleWorks)
5. Graphics (Mouse Paint)
6. Disk Management

Just determining these topics and going through only a part of them took the better part of an hour. It looks like at least a two hour task. Of course, you do not have to do the whole thing at one sitting. Once you chuckle your way through the opening graphics and sound, a main menu allows you to pick and choose.

Whether you are a new or old hand at the computer game, working through this disk is good practice. The newer you are, the more you cover. For the old hands, a cursory look at each topic is sufficient.

I ordered the GSRAM expanded memory card with 1MB from Applied Engineering. On the day my IIGS arrived, by using my VISA card and paying an extra $15, the card ordered at 2 p.m. arrived by UPS by 10 a.m. the next morning. The IIGS does recognize the card. Having gone to the Control Panel, I arbitrarily picked a minimum and maximum RAM disk size. As the manual instructed, I rebooted the system. An on-line inquiry shows the standard /RAM disk in Slot 3,

Drive 2. I have only one UniDisk, the second RAM drive from the GSRAM card shows up as Slot 5, Drive 2. When I set the minimum and maximum disk sizes back to zero, a CONTROL-OPEN APPLE-RESET reboot did not appear to free up the RAM. I had to power off/power on reboot the system.

With this 1MB of additional memory in mind, refer back to the Control Panel RAM Disk panel. If you add 84 to 1195, you obtain 1,279. Subtract 1024 for the 1MB card to obtain 255. This reflects the fact that the IIGS comes with 256K a RAM already installed. 128K of this is available to ProDOS 8 just as if you are working with a IIe, IIc, etc. It is my understanding the other 128K is used by the system.

I tried to expand my current AppleWorks 1.3 to take advantage of the extra memory. Version 4.8 of "Super AppleWorks Desktop Expander" did not result in taking advantage of the extra memory. Fortunately, my upgrade to Version 2.0 of AppleWorks had arrived. It does recognize the card and one ends up with 1149K available.

I did discover one disappointing fact I am sure will be solved by someone soon. My printer is a tired old RS232C serial based TI 820. My modem is an external RS232C based Prometheus Promodem. The IIGS comes with RS232C ports to support both devices, however, no cables are available. The IIGS has two small eight pin sockets for these ports. Unfortunately, they are not standard sockets, e.g., cannot be purchased at your local Radio Shack. To meet my needs, I had to buy a standard interface cable with the two eight pin sockets on either end. I cut this cable into two pieces and soon had the necessary cables with the standard 25 pin connectors.

The "Apple IIGS Owner's Guide", Appendix D, Page 161 shows the pin assignments for the Apple standard connector viewed looking at the computer. The part number for the cable is 590-0340-A. For the male pins in the connector, the following are the wire colors.

Pin 1	-	White	Pin 5	-	Black
Pin 2	-	Red	Pin 6	-	Gray
Pin 3	-	Blue	Pin 7	-	Brown
Pin 4	-	Yellow	Pin 8	-	Green

My modem is an external Prometheus ProModem 1200. Given female pins on the modem connector, the following wiring works for me and should work for any external modem.

Modem	IIGS
2	5
3	3
6	1
7	4
8	7
20	2

Before the modem worked with my current telecommunications software, I had to go to the Control Panel Modem option. On this, I chose only the DSR/DTR Handshake option.

In the process of getting my printer and modem connected, I used a 3.5" disk I commonly use on my IIe. Every pre-IIGS application I have, seems to work on the IIGS . Just as was the case when the IIe replaced the II+, time will tell how many existing applications will work on the IIGS . I will later give some reasons for this statement.

With the system up and running to my satisfaction, the next step was to browse through the Apple IIGS System Disk called /SYSTEM.DISK. Through existing utilities on my IIe, I made a copy of this 3.5" disk and began to work with it. Just for laughs, before I left the IIe to go to the IIGS, I tried booting the system disk on the IIe. As I expected, it bombed with the message "ProDOS 16 REQUIRES IIGS HARD WARE".

Upon booting the System Disk, the first thing noted is ProDOS 16 Version 1.0 dated 16 Sep 86 is used to fire up the system. After some considerable disk work with "One moment please..." displayed, the "Apple IIGS Program Launcher" menu appears. Although all but one screen is designed around using the mouse, it is possible to use the arrow keys, the RETURN key, the ESCAPE key, etc. to navigate through the various programs and utilities.

The Launcher screen currently shows four directories as indicated by the file folder icon. The four folders are called APPLETALK, DESKTOP, SYS.UTILS, and SYSTEM. Before proceeding further, it is interesting to note everything on the disk is written using ProDOS 8. The only exception is the launcher is written in ProDOS 16. In talking with other experts who received IIGS systems before its public announcement, I am led to believe many packages will come out using many of the directories (folders) already existing on the disk. My only concern in this manner is 450K out of the possible 800K is already in use on the disk. We have already outgrown the 5 1/4" disk, the 3.5" disk is filling up, so are we being forced to buy a hard disk? I hope not at the current prices.

Selecting the APPLETALK folder drops you into another window. Two system files as evidenced by the hand holding a

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disk are highlighted via a bold face type in this menu. There are also some file names shown in a gray background. Only the highlighted files can be selected. APPLETALK is Apple's version of a local area network (LAN). Since I am not on a network, I could not test this software. It can be deleted to make room for your own stuff on the system disk.

Choosing the DESKTOP folder shows one folder called DESK.ACC and a system file called DESKTOP1. Selecting DESK.ACC shows files in a gray background. This sort of situation exists throughout the system. They represent files which cannot be selected, however, they are necessary to support other functions. In this case, they support the system file DESKTOP1.

Selecting the DESKTOP1 folder drops you into a program selector environment. Some people choose to call this a session manager. Anyway, by clicking the system disk icon, icons appear whose names are the same as shown in the launcher menu. By double clicking on an icon, the indicated system is launched or the indicated file folder is opened to show the files under that folder.

In addition to the icons, there is a whole host of functions available via pull down menus. Under a solid apple choice there is a calculator, a puzzle, the ability to change the date (not the time), the ability to display a file (the screen shows "Show a text file", however, the system does not care what type the file is), and the ability to sort a directory.

Under the File heading, one can create a new folder, i.e., a directory. With respect to active windows and folders, there is the ability to open a folder, close a single folder, close all folders, or select all the icons in the current window. Besides this, you can also copy files or delete files. You can make the system eject a 3.5" disk in a drive. Finally, you can QUIT from the desktop and return back to the launcher.

The View heading changes the way files, folders, etc. are shown in the window. By default, they are shown as icons with the file name below the icon. One can show the files by name only, much the same way as from the 40 column CAT command in BASIC.SYSTEM. Showing the files by date shows the newest file on the top and the oldest file on the bottom. Showing by size results in the largest file first down to the smallest file in terms of blocks. Showing by type shows the files grouped together by file type.

The Special heading provides several functions. These are format a disk, erase a disk, and copy a disk. There is also the ability to lock or unlock files. If you select a single file, it is locked/unlocked. If you select a folder, i.e., a directory, all files in that folder are locked/unlocked. A get file information option shows the name for a file, whether it is locked or not, its size, its creation date, its last modification date and its type. Using the get size option shows the size of a single file, if selected, or the number of files and blocks used in an entire folder. One can also rename an icon which is the same as renaming a file.

The Startup heading to me has a misleading name. If you pull down this menu and, for example, select Slot 5, you cause the system to reboot from that drive. I would prefer a heading of Restart or Reboot.

The Selector heading allows you to create a run list for quick program selection. The items in this run list are displayed in a special window before the desktop is fired up. By means of this, you can run a program or system immediately without going to the desktop.

This desktop is a very powerful tool deserving an evening or two just working with it. Remember the copy a file feature under the File heading? Why bother with it. As an example, I created a MODEM folder for my favorite communications package. I opened a second window by selecting the floppy disk drive with the package distribution files. By selecting a file entry in the floppy disk window, dragging it to the MODEM icon in the 3.5" window, the file was copied with no keystrokes required, just mouse work. The more you use a mouse, the more it grows on you.

Back to the launcher, selecting the SYS.UTILS folder places you in the Apple IIGS System Utilities. This is not a mouse driven package, it appears to be a beefed up utility provided with the 3.5" disk for the IIe or the IIc. It is menu driven with items being selected by using the arrow keys to move to the desired item then pressing the RETURN key to begin the desired operation. The utilities included are catalog a disk, list volumes, duplicate a disk, format a disk, copy files, delete files, rename files, lock files, unlock files, create a subdirectory, set a prefix, and rename volumes. Those of you who have worked some with ProDOS, the utilities greatly resemble the FILER utility.

Selecting the SYSTEM folder from the launcher brings up a window showing folders for such things as DESK.ACCS, DRIVERS, FONTS, SYSTEM.SETUP, and TOOLS. Some of these folders are empty. In talking with other experts with early IIGS experience, there are plans for these folders. In other words, they should not be deleted.

Going back to the launcher, there are two system files shown. These are indicated by an icon which is a hand holding a disk. One of the files is DESKTOP.SYS16. It is the system file for the launcher code.

The second file is called BASIC.SYSTEM, our old friend who, with ProDOS, replaced DOS 3.3. It is still Version 1.1 dated 18 JUN 84. I compared the version shipped with the IIGS to the version provided starting at Version 1.02 of ProDOS. There are no differences in the versions which means Apple did not bother to fix the CHAIN problem.

Having finished browsing through the utilities disk, I became curious about the files it contains. I formatted a 3.5" disk and copied the latest ProDOS 1.2 to it. I then copied the DESKTOP directory to the root of the new 3.5" disk. I took care to respect the directories under the DESKTOP directory, i.e., I created the necessary sub directories and copied the appropriate files. Finally, I renamed the system file DESKTOP1 to DESKTOP1.SYSTEM to satisfy ProDOS in its boot process. The disk boots fine and appears to be operational. After adding BASIC.SYSTEM to the disk, I still had 634K left of the 800K possible.

Moving on to AppleSoft, there is no indication a 16 bit version is in the works. Therefore, we are stuck with the 8 bit version. In the IIGS , the AppleSoft code was taken from the IIc ROM code, not the enhanced IIe ROM code. Comparing the two ROM codes revealed the following differences:

LOC	IIGS	IIc
$E006	$00	$96
$F1FE	$30	$50
$F233	$D9	$09
$F234	$F8	$F2
$F3CB	$20	$AD
$F3CC	$3A	$79
$F3CD	$F9	$C0

$E006 is sort of a signature byte never used in any code I have seen. On the Enhanced IIe, this location contains $C4.

Apple has always followed the industry standard by making

it possible to run almost all code on a new machine. Of course, code on a new machine such as the IIGS may not run on an older model such as the Enhanced IIe. I have already given an example of this in the IIGS System Disk discussion.

If it is necessary to identify the hardware before executing the program, the following table has been upgraded to include the IIGS .

Machine	$FBB3=64435	$FB1E=64286	$FBC0=64448
II	$38=56		
II+	$EA=234	$AD=173	
III	$EA=234	$8A=138	
IIe	$06=6		$EA=234
IIe (Enhanced)	$06=6		$E0=224
IIc	$06=6		$00=0
IIGS	$06=6	$4C=76	$E0=224

From a ProDOS point of view, its machine identification byte, at location $BF98 in the global page, does not appear to change compared to a IIe or a IIc.

In nosing around inside the IIGS working with BASIC once in a while or working with the ROM monitor, I did notice one change (I am sure there are more). For the DELETE key, instead of getting the checkerboard character on the screen, on the IIGS the cursor is moved left one position. In other words, it functions like the left arrow key. I like this because after an AppleWorks session, there is a tendency to automatically hit the DELETE key if a typing mistake is made.

With all this preliminary stuff out of the way, now was the time to dig deeper into the system. Without any technical reference manuals, I can only make observations based on previous experience with the II+, IIe, Enhanced IIe, and the IIc.

First of all, remember the IIGS is a dual mode machine because its heart is the 65816 microprocessor. When the system is booted, it comes up in 8 bit mode and everything looks almost like the 6502/65C02 days. It is this 8 bit mode which will be discussed here, access to the 16 bit world seems to be limited at present only because technical details have not been released to the public, but are available thru APDA. I said "almost like" in a previous paragraph. As long as you stay under the control of BASIC.SYSTEM and AppleSoft or use standard pre-IIGS programs, the only difference you will notice is speed. If you set the speed to normal using the Control Panel, no difference in speed will be noticed. If you choose fast speed, your programs could run as much as 2.8 times faster. Given a lot of floppy disk work, this 2.8 figure will be lower because floppy disk I/O depends on a 1 Mhz mode of operation.

With regard to the ROM monitor code, changes have to be expected because of the difference microprocessor. This is to be expected as evidenced by changes made from II to II+, from II+ to IIe, etc. When the IIe came out, some old II+ and earlier programs bombed because the assembly language programmer used some non -standard entry points into the ROM monitor code.

I ran a comparison between the Enhanced IIe ROM monitor code and the IIGS ROM monitor code. As near as I can tell standard entry points such as HOME to clear the screen, CLREOL to clear to the end of the current line, still have the same location for an entry point. I would say that 99% of old programs will run on the IIGS without modification. Based on what we learned in going from the II+ to the IIe, I would say the problems will be much less than going from the IIe to the IIGS . In other words, the software industry learned some hard lessons.

Beyond the standard entry points, there are some subtle differences in the IIGS ROM monitor code compared to the previous II series of systems. Because the IIGS goes up into the megabyte range of operation, more than four hex digits are required to specify an address. The IIGS ROM code handles this by means of a "page" number and a four digit address within the page. A page in this context is 64K, not the normal 256 bytes.

If I want to examine memory in the first 64K, i.e., I am in 8 bit mode and "look" like say a IIe, I enter 0/33 to obtain the contents of location $33. Once I do something like 0/33, in future operations I do not need the "0/", a mere "33" does the job. In other words, the system has a way of remembering the current "default" page. When contents of memory locations are dumped to the screen, not only the hex contents are shown, but also, for each location its corresponding displayable character is shown, if possible. If not, a period is displayed. The display process is also sensitive to whether 40 or 80 column mode is active. In 40 column mode, 8 values per line are displayed. In 80 column mode, 16 values per line are displayed.

Let's suppose my default is the first 64K. I now perform something like F800L to disassemble some graphics code in the ROM monitor. What I obtain is garbage code. To examine ROM monitor code or AppleSoft ROM code, my default page must be $FF. The disassembly process not only includes the address to be taken by a branch instruction, but also, now shows the distance for the branch. For each screen of disassembly, there are some parameters displayed at the top of the screen. One of them appears to show which bank at $D000 is active in the "language card". It is not clear what the other two parameters indicate.

The miniassembler is still with us. With all the high level languages available today, one might wonder why the miniassembler and disassembler have not vanished into the sunset. For one thing, they are tools which satisfy us old folks who let the young kids work with the fancy stuff. More importantly, no matter how efficient high level languages are in terms of speed, nothing will ever be as fast as an application written in assembly language code.

I am sure several more pages could be added to this article, however, I feel I have given you a reasonable introduction to the new IIGS. I don' t regret buying the system even if there is a video problem with some of the colors. I have faith in Apple and their ability to correct the problem.

If you have any further questions, drop me a line via *Call - A.P.P.L.E* or give me a call, my phone number is listed among the consultants.

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61 Excellent **62** Good **63** Fair **64** Poor

Modular Assembly Language Programming Part II: *A Musical Fanfare*

Bob Bishop

This month, we are going to look at subroutine CHORD, a module that plays 3-note chords through the Apple's built-in speaker. The module works by the principal known as "pulse width modulation. In simple terms, pulse width modulation means that by clicking the Apple's built-in speaker fast enough (and at the right times) we can create waveforms other than the sqauare waves that the speaker normally produces. However, it is not necessary to understand *how* the module works in order to *use* it. (One of the advantages of modular programming is that subroutines can be regarded as easy-to-use "little black boxes" whose internal workings need not be understood by the user.) The source listing for subroutine CHORD is given in Listing 1. Table 1 describes how to use it.

Notice that subroutine CHORD contains two EXTRNs: SAVE0 and UNSAVE0. Both SAVE0 and UNSAVE0 are contained in the SAVE0 module whose source listing was presented in Part I of this series.

We see that the ENTRY named CHORD has several calling parameters (CHORD-6 through CHORD-1) specifying the notes to be played, and the duration of those notes. By passing its calling parameters in the six bytes immediately preceding the entry point, the subroutine avoids confiscating absolute memory locations. Because the subroutine module is relocatable (its absolute location in memory is not known until the linking loader puts it somewhere), the subroutine calling parameters follow the module into whichever memory locations it ultimately gets assigned.

Let's use subroutine CHORD to play a C-major triad (C, E and G) for a duration of one second. Figure 2 shows the three notes that make up this chord and Listing 2 is a program that plays it. You might want to experiment with this program by changing the notes to be played and their duration value.

Subroutine CHORD plays only one chord at a time. More often than not, we are interested in playing sequences of many chords (i.e., a complete "song"). Subroutine ORGAN (shown in Listing 3 and Table 2) is a module for playing an entire musical score.

Subroutine ORGAN has only one calling parameter: a 2-byte pointer to the musical score to be played. A 2-byte pointer, as implemented in the 6502, is a 16-bit quantity (two consecutive bytes) representing an address in memory. The eight least significant bits of the address are contained in the first byte, while the eight most significant bits are contained in the second byte.

As an example of how to use subroutine ORGAN consider the program shown in Listing 4. It plays the opening fanfare from Richard Strauss' "Also Sprach Zarathustra". (For those readers whose musical awarness never got past rock 'n' roll, this piece may be better known as the music from: "2001, A Space Odyssey".) You might also recognize the slightly longer musical selection shown in Listing 5, especially if you purchased your Apple II back in the 1970's.

That's all for this month. Have fun using these new modules to generate your own songs. Next time we'll start to fiddle a slightly different tune by looking at some fun-to-use hires graphics modules.

FIGURE 1

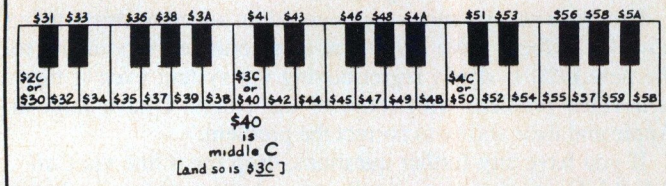
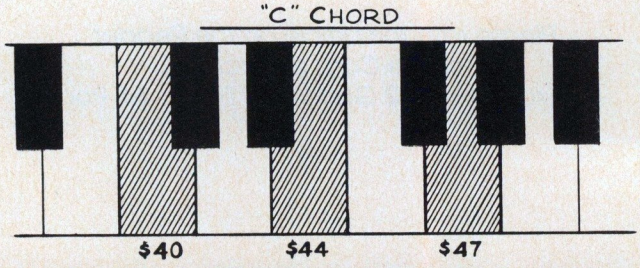


FIGURE 2



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59 Excellent **60** Good **61** Fair **62** Poor

LISTING 1

```
                        REL
                        ORG     $1000
*
                        ENTRY   CHORD
                        EXTRN   SAVE0
                        EXTRN   UNSAVE0
*
ARROW       EQU     $00
COUNTS      EQU     $02
TINY        EQU     $03
MINLO       EQU     $04
MINHI       EQU     $07
MAXLO       EQU     $0A
MAXHI       EQU     $0D
NOTE        EQU     $10
RESETLO     EQU     $13
RESETHI     EQU     $16
CLOCKLO     EQU     $19
CLOCKHI     EQU     $1C
THRESH      EQU     $1F
AMP         EQU     $20
DELTA       EQU     $23
*
```

THREE-NOTE CHORD PLAYER

```
*
* ENTER WITH:
*  CHORD-6: POINTER TO SCRATCH
*  MEMORY (256 BYTES)
*  CHORD-4: DURATION OF THE CHORD
*  IN UNITS
*   OF 1/16 SEC. (RANGE : $01-$38)
*  CHORD-3,-2,-1: THE THREE NOTES
*  TO BE PLAYED
*   MS NIBBLE: OCTAVE ($1-$7)
*   LS NIBBLE: NOTE ($0-$C)
*
* NOTE $40 IS CLOSE TO MIDDLE C
* NOTE $00 IS A NULL NOTE (SILENCE)
*
* FOR BEST RESULTS, $3 <= OCTAVE <= $5
* (NOTES <$12 DO NOT EXIST!)
*
SCRATCH     DW      $9600
DURATION    DS      1
NOTES       DS      3
*
CHORD       LDA     #$25
            JSR     SAVE0
*
* COPY THE CALLING PARAMETERS
*
            LDA     SCRATCH+0
            STA     ARROW+0
            LDA     SCRATCH+1
            STA     ARROW+1
*
* MULTIPLY THE DURATION BY 4.5
* AND STORE THE RESULT IN 'COUNTS'
*
MAINLOOP    LDA     DURATION
            ASL     A
            ASL     A
            ASL     A
            PHP
            CLC
            ADC     DURATION
            PLP
            ROR     A
            STA     COUNTS
*
* COPY (AND TUNE) THE THREE NOTES TO
* BE PLAYED
*
            LDX     #$02
XEROX       LDA     NOTES,X
            STA     NOTE,X
            CMP     #$00
            BEQ     NEXTNOTE
            DEC     NOTE,X
            AND     #$0F
            BNE     NEXTNOTE
            LDA     NOTE,X
            AND     #$FB
            STA     NOTE,X
NEXTNOTE    DEX
            BPL     XEROX
*
* CALL THE MAIN ROUTINES
*
            JSR     INIT
            JSR     COMPOSER
            JSR     PLAYER
            JMP     UNSAVE0
*
* MUSIC MAKER
*
COMPOSER    LDY     #$00
            STY     THRESH
            INY
*
* FIND THE SMALLEST NON-
* ZERO CLOCK PERIOD
*
LOOP        LDA     CLOCKHI+0
            BNE     LDX1
            LDA     #$FF
LDX1        LDX     CLOCKHI+1
            BEQ     LDX2
            CMP     CLOCKHI+1
            BCC     LDX2
            TXA
LDX2        LDX     CLOCKHI+2
            BEQ     GOTTINY
            CMP     CLOCKHI+2
            BCC     GOTTINY
            TXA
GOTTINY     STA     TINY
            CMP     #$FF
            BNE     OUTPUT
*
* A 'REST' NOTE
*
            LDA     #$20
            STA     (ARROW),Y
            INY
            JMP     ABORT
*
* OUTPUT THRESH+TINY
*
OUTPUT      CMP     #$40
            BCC     NOTBIG
OUTLOOP     TAX
            LDA     #$3F
            ORA     THRESH
```

```
                        LDA     TABLE,Y
                        STA     RESETHI,X
                        LDA     NOTE,X
                        LSR     A
                        LSR     A
                        LSR     A
                        LSR     A
                        TAY
                        SEC
OCTAVE                  ROR     RESETHI,X
                        ROR     RESETLO,X
                        DEY
                        BNE     OCTAVE
NEXTINIT                LDA     RESETHI,X
                        STA     CLOCKHI,X
                        LSR     A
                        STA     DELTA+1
                        LDA     RESETLO,X
                        STA     CLOCKLO,X
                        ROR     A
                        STA     DELTA+0

*
* ESTABLISH TOLERANCE WINDOW
*
                        LSR     DELTA+1
                        ROR     DELTA+0
                        SEC
                        LDA     RESETLO,X
                        SBC     DELTA+0
                        STA     MINLO,X
                        LDA     RESETHI,X
                        SBC     DELTA+1
                        STA     MINHI,X
                        CLC
                        LDA     RESETLO,X
                        ADC     DELTA+0
                        STA     MAXLO,X
                        LDA     RESETHI,X
                        ADC     DELTA+1
                        STA     MAXHI,X

*
                        DEX
                        BPL     INITLOOP
                        RTS

*
TABLE                   DFB     255,227,200,175
                        DFB     150,128,106,86
                        DFB     67,48,31,15,0

*
* MUSIC PLAYER
*
CLOCK           EQU     $03
INDEX           EQU     $05
*
PLAYER                  LDY     #$00
                        STY     CLOCK+0
                        STY     CLOCK+1
                        LDA     (ARROW),Y
                        STA     INDEX
                        JMP     ENTER

*
FROM30                  STA     $C030
*
LEVEL0                  STA     $C030
                        STA     $C030
                        LSR     A
                        AND     #$3F
                        TAX
                        ADC     CLOCK+0
                        STA     CLOCK+0
                        LDA     #$00
                        ADC     CLOCK+1
                        STA     CLOCK+1
                        DEX
                        BEQ     NEXT
                        JMP     XDELAY0

*
FROM31                  STA     $C030
*
LEVEL1                  STA     $C030
                        LSR     A
                        AND     #$3F
                        TAX
                        ADC     CLOCK+0
                        STA     CLOCK+0
                        LDA     #$00
                        STA     $C030
                        ADC     CLOCK+1
                        STA     CLOCK+1
                        DEX
                        BEQ     NEXT
                        JMP     XDELAY1

*
FROM32                  STA     $C030
*
LEVEL2                  STA     $C030
                        LSR     A
                        AND     #$3F
                        TAX
                        ADC     CLOCK+0
                        STA     CLOCK+0
                        LDA     #$00
                        ADC     CLOCK+1
                        STA     CLOCK+1
                        DEX
* 24 U-SEC FROM ^ TOGGLE
                        BEQ     NEXT2
                        JMP     XDELAY2

*
FROM33                  STA     $C030
*
LEVEL3                  STA     $C030
                        LSR     A
                        AND     #$3F
                        TAX
                        ADC     CLOCK+0
                        STA     CLOCK+0
                        LDA     #$00
                        ADC     CLOCK+1
                        STA     CLOCK+1
                        DEX
* 24 U-SEC FROM ^ TOGGLE
                        BEQ     NEXT3
                        JMP     XDELAY3

*
* 31 U-SEC FROM ^ TOGGLE
NEXT                    CMP     COUNTS
                        BEQ     RETURN
                        DEY
                        BNE     CONT
ENTER                   LDY     INDEX
CONT                    LDA     (ARROW),Y
                        ASL     A

* 48 U-SEC FROM ^ TOGGLE
*
                        BCS     CARRYON
                        BMI     TOLEV1
                        BPL     LEVEL0
TOLEV0                  BMI     LEVEL3
CARRYON                 BPL     LEVEL2
```

```
415  TOLEV1          JMP     LEVEL1
416  *
417  * 27 U-SEC  FROM ^ TOGGLE
418  NEXT2           CMP     COUNTS
419                  BEQ     RETURN
420                  DEY
421                  STA     $C030
422                  BNE     CONT2
423                  LDY     INDEX
424  CONT2           LDA     (ARROW),Y
425                  ASL     A
426  * 48 U-SEC FROM ^ TOGGLE
427  *
428                  BCS     CARRYON
429                  BMI     TOLEV1
430                  JMP     LEVEL0
431  *
432  * 27 U-SEC FROM ^ TOGGLE
433  NEXT3           CMP     COUNTS
434                  BEQ     RETURN
435                  DEY
436                  BNE     CONT3
437                  LDY     INDEX
438  CONT3           LDA     (ARROW),Y
439                  ASL     A
440  * 44 U-SEC FROM ^ TOGGLE
441  *
442                  BCS     CARYON3
443                  BMI     TO1FROM3
444                  JMP     FROM30
445  CARYON3         BMI     FROM33
446                  JMP     FROM32
447  TO1FROM3        JMP     FROM31
448  *
449  RETURN          RTS
450  *
451  LOOP0           PHP
452                  PLP
453  XDELAY0         JSR     DELAY22
454                  STA     $C030
455                  STA     $C030
456                  JSR     DELAY15
457                  DEX
458                  BNE     LOOP0
459                  BEQ     *+2
460                  JMP     NEXT
461  *
462  LOOP1           PHP
463                  PLP
464  XDELAY1         JSR     DELAY22
465                  STA     $C030
466                  JSR     DELAY15
467                  STA     $C030
468                  DEX
469                  BNE     LOOP1
470                  BEQ     *+2
471                  JMP     NEXT
472  *
473  * 29 U-SEC FROM ^ TOGGLE
474  LOOP2           JSR     DELAY22
475  XDELAY2         PHP
476                  PLP
477                  STA     $C030
478                  JSR     DELAY15
479                  STA     $C030
480                  DEX
481                  BNE     LOOP2
482                  JSR     DELAY18
483                  JMP     NEXT2
484  *
```

```
485  * 29 U-SEC FROM ^ TOGGLE
586  LOOP3           JSR     DELAY22
487  XDELAY3         JSR     DELAY22
488                  STA     $C030
489                  STA     $C030
490                  DEX
491                  BNE     LOOP3
492                  JSR     DELAY18
493                  JMP     NEXT3
494  *
495  * PRECISION DELAYS
496  *
497  DELAY22         NOP
498                  NOP
499  DELAY18         JMP     DELAY15
500  DELAY15         JMP     DELAY12
501  DELAY12         RTS
502  *
```

TABLE 1

Module: CHORD.OBJ0 **LENGTH: $02E3**

ENTRYs: CHORD

EXTRNs: SAVE0, UNSAVE0

Description:

Plays 3-note chords through the Apple's built-in speaker.

Enter with:

CHORD-6: a 2-byte pointer to a 256-byte work area in memory (The default value for this pointer is $9600.)

CHORD-4: the duration of the chord (in 1/16 second). The duration must be in the range: $01-$38 (1-56 decimal).

CHORD-3,-2,-1: the three notes to be played.
Each note (byte) consists of:
Most Significant Nibble: octave ($1-$7)
Least Significant Nibble: note ($0-$C)

(See FIGURE 1)

Note $40 is close to middle C.
For best results the octave should be close to $4 (i.e. a void the extremes).
Notes less than $12 do not exist, except for $00.
Specifying a note of $00 turns off the note in the chord. (For example, to play a single note, instead of a chord, you can specify two ofthe notes to be $00. You could also produce a single note by specifying an identical value for each of the three notes; this will produce a louder note than that produced by the "$00" method.
Specifying $00 for all three notes produces a rest.)

Return with:

X-Register: unmodified
Y-Register: unmodified

LISTING 2

```
1           REL
2           ORG     $1000
3   *
4           EXTRN   CHORD
5   *
6   * THIS PROGRAM PLAYS A C-MAJOR TRIAD
7   *
8           LDA     #16
9           STA     CHORD-4     ; SETS DURATION
10          LDA     #$40
11          STA     CHORD-3     ; MIDDLE C
12          LDA     #$44
13          STA     CHORD-2     ; E NATURAL
14          LDA     #$47
15          STA     CHORD-1     ; G NATURAL
16          JSR     CHORD
17          RTS
18  *
```

TABLE 2

Module: ORGAN.OBJ0 **Length: $0033**

ENTRYs: ORGAN

EXTRNs: CHORD, SAVE0, UNSAVE0

Description:

Plays an entire musical score consisting of 3-note chords.

Enter with:

ORGAN-2: a 2-byte pointer to the musical score to be played.

The score consists of 4-byte sets, terminated by $00. The first byte of each set is the duration (in 1/16 second). The duration must be in the range: $01-$38 (1-56 decimal).

The remaining three bytes of the set are the three notes to be played. Each note (byte) consists of:

Most Significant Nibble: octave ($1-$7)
Least Significant Nibble: note ($0-$C)
(See subroutine CHORD)

Return with:

X-Register: unmodified
Y-Register: unmodified

LISTING 3

```
1           REL
2           ORG     $1000
3   *
4           ENTRY   ORGAN
5           EXTRN   CHORD
6           EXTRN   SAVE0
7           EXTRN   UNSAVE0
8   *
9   POINTER EQU     $00
10  *
11
12
13  THREE-NOTE CHORD ORGAN                              *
14
15
16  *
17  * ENTER WITH:
18  *   ORGAN-2: POINTER TO THE MUSICAL SCORE
19  *
20  * THE MUSICAL SCORE CONSISTS OF 4-BYTE
      SETS.  THE
21  * FIRST BYTE OF EACH 4-BYTE SET IS THE
      DURATION OF
22  * THE CHORD, FOLLOWED BY THE THREE
      NOTES
23  * TO BE PLAYED.  (SEE ENTRY "CHORD")
24  * THE SCORE IS TERMINATED BY A $00 BYTE.
25  *
26  SCORE   DS      2
27  *
28  ORGAN   LDA     #$02
29          JSR     SAVE0
30  *
31          LDA     SCORE+0
32          STA     POINTER+0
33          LDA     SCORE+1
34          STA     POINTER+1
35          LDY     #$00
36  *
37  MAINLOOP LDA    (POINTER),Y
38          BEQ     EXIT
39          STA     CHORD-4
40          LDX     #$02
```


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```
41  XEROX   INY
42          LDA     (POINTER),Y
43          STA     CHORD-3,X
44          DEX
45          BPL     XEROX
46          JSR     CHORD
47          INY
48          BNE     MAINLOOP
49          INC     POINTER+1
50          JMP     MAINLOOP
51  *
52  EXIT    JMP     UNSAVE0
53  *
```

LISTING 4

```
1           REL
2           ORG     $1000
3   *
4           EXTRN   ORGAN
5   *
6           LDA     #>MUSIC
7           STA     ORGAN-2
8           LDA     #<MUSIC
9           STA     ORGAN-1
10          JMP     ORGAN
11  *
12  MUSIC   DFB     $08,$00,$00,$00
13          DFB     $18,$30,$00,$00
14          DFB     $18,$37,$37,$00
15          DFB     $03,$37,$37,$00
16          DFB     $21,$40,$40,$00
17          DFB     $0C,$00,$00,$00
18          DFB     $03,$44,$44,$00
19          DFB     $15,$30,$45,$49
20          DFB     $18,$39,$45,$49
21          DFB     $0B,$35,$45,$49
22          DFB     $01,$00,$00,$00
23          DFB     $06,$35,$40,$49
24          DFB     $06,$32,$47,$4B
25          DFB     $17,$30,$45,$50
26          DFB     $01,$00,$00,$00
27          DFB     $17,$32,$4B,$52
28          DFB     $01,$00,$00,$00
29          DFB     $0C,$37,$47,$54
30          DFB     $0C,$40,$47,$55
31          DFB     $0C,$40,$47,$57
32          DFB     $0C,$47,$50,$57
33          DFB     $0C,$44,$47,$57
34          DFB     $0C,$40,$47,$54
35          DFB     $0C,$40,$47,$50
36          DFB     $0B,$40,$44,$47
37          DFB     $01,$00,$00,$00
38          DFB     $06,$40,$47,$54
39          DFB     $06,$40,$50,$55
40          DFB     $21,$40,$47,$57
41          DFB     $03,$00,$00,$00
42          DFB     $17,$35,$40,$59
43          DFB     $01,$00,$00,$00
44          DFB     $17,$42,$47,$5B
45          DFB     $01,$00,$00,$00
46          DFB     $03,$40,$47,$60
47          DFB     $15,$40,$47,$60
48          DFB     $18,$30,$37,$40
49          DFB     $24,$20,$30,$00
50          DFB     $00
51  *
```

LISTING 5

```
1           REL
2           ORG     $1000
3   *
4           EXTRN   ORGAN
5   *
6           LDA     #>MUSIC
7           STA     ORGAN-2
8           LDA     #<MUSIC
9           STA     ORGAN-1
10          JMP     ORGAN
11  *
12  MUSIC   DFB     $06,$00,$00,$00
13          DFB     $06,$40,$00,$00
14          DFB     $06,$40,$00,$00
15          DFB     $06,$37,$00,$00
16          DFB     $06,$37,$00,$00
17          DFB     $06,$34,$00,$00
18          DFB     $06,$34,$00,$00
19          DFB     $0C,$30,$00,$00
20          DFB     $06,$37,$37,$00
21          DFB     $03,$37,$37,$00
22          DFB     $03,$37,$37,$00
23          DFB     $07,$39,$39,$00
24          DFB     $08,$3A,$3A,$00
25          DFB     $10,$3B,$3B,$00
26          DFB     $0A,$37,$00,$00
27          DFB     $03,$44,$44,$00
28          DFB     $03,$42,$32,$00
29          DFB     $03,$40,$34,$37
30          DFB     $03,$3B,$34,$37
31          DFB     $03,$40,$34,$37
32          DFB     $03,$42,$37,$3B
33          DFB     $03,$40,$34,$37
34          DFB     $03,$37,$30,$00
35          DFB     $03,$34,$30,$00
36          DFB     $03,$35,$30,$00
37          DFB     $03,$37,$30,$34
38          DFB     $03,$39,$30,$34
39          DFB     $03,$37,$30,$34
40          DFB     $03,$34,$30,$27
41          DFB     $06,$37,$30,$34
42          DFB     $03,$40,$34,$37
43          DFB     $03,$42,$37,$3B
44          DFB     $06,$44,$37,$40
45          DFB     $06,$44,$37,$40
46          DFB     $03,$44,$37,$40
47          DFB     $03,$42,$37,$3B
48          DFB     $03,$40,$34,$37
49          DFB     $03,$42,$37,$3B
50          DFB     $06,$44,$37,$40
51          DFB     $06,$42,$37,$3B
52          DFB     $06,$42,$37,$3B
53          DFB     $03,$44,$37,$40
54          DFB     $03,$42,$3B,$3B
55          DFB     $03,$40,$34,$37
56          DFB     $03,$3B,$34,$37
57          DFB     $03,$40,$34,$37
58          DFB     $03,$42,$37,$3B
59          DFB     $03,$40,$34,$37
60          DFB     $03,$37,$30,$00
61          DFB     $03,$34,$30,$00
62          DFB     $03,$35,$30,$00
63          DFB     $03,$37,$30,$34
64          DFB     $03,$39,$30,$34
65          DFB     $03,$37,$30,$34
66          DFB     $03,$34,$30,$27
67          DFB     $06,$37,$30,$34
68          DFB     $03,$40,$30,$50
```

```
69      DFB     $03,$42,$32,$52
70      DFB     $06,$44,$34,$54
71      DFB     $03,$47,$37,$57
72      DFB     $03,$49,$39,$59
73      DFB     $03,$47,$37,$57
74      DFB     $03,$44,$34,$54
75      DFB     $03,$40,$30,$50
76      DFB     $03,$42,$32,$52
77      DFB     $03,$44,$34,$54
78      DFB     $03,$40,$30,$50
79      DFB     $03,$42,$32,$52
80      DFB     $03,$3B,$2B,$4B
81      DFB     $0C,$40,$30,$50
82      DFB     $03,$44,$37,$40
83      DFB     $06,$47,$37,$40
84      DFB     $03,$44,$37,$40
85      DFB     $06,$47,$37,$40
86      DFB     $06,$47,$37,$40
87      DFB     $03,$44,$37,$40
88      DFB     $06,$47,$37,$40
89      DFB     $03,$44,$37,$40
90      DFB     $0C,$47,$37,$40
91      DFB     $03,$45,$39,$40
92      DFB     $06,$49,$40,$35
93      DFB     $03,$45,$39,$40
94      DFB     $06,$49,$40,$35
95      DFB     $06,$49,$40,$35
96      DFB     $03,$45,$39,$40
97      DFB     $06,$49,$40,$35
98      DFB     $03,$45,$39,$40
99      DFB     $0C,$49,$40,$35
100     DFB     $03,$4B,$00,$00
101     DFB     $03,$50,$40,$00
102     DFB     $03,$52,$42,$00
103     DFB     $03,$50,$40,$00
104     DFB     $03,$49,$39,$00
105     DFB     $03,$47,$37,$00
106     DFB     $03,$50,$40,$00
107     DFB     $03,$47,$37,$00
108     DFB     $03,$45,$35,$00
109     DFB     $03,$44,$34,$00
110     DFB     $03,$47,$37,$00
111     DFB     $03,$44,$34,$00
112     DFB     $03,$40,$30,$00
113     DFB     $06,$42,$32,$00
114     DFB     $03,$40,$34,$37
115     DFB     $03,$42,$3B,$37
116     DFB     $06,$44,$37,$40
117     DFB     $03,$47,$40,$44
118     DFB     $03,$49,$40,$45
119     DFB     $03,$47,$40,$44
120     DFB     $03,$44,$37,$40
121     DFB     $03,$40,$34,$37
122     DFB     $03,$42,$37,$3B
123     DFB     $03,$44,$37,$40
124     DFB     $03,$40,$34,$37
125     DFB     $03,$42,$37,$3B
126     DFB     $03,$3B,$32,$37
127     DFB     $0C,$40,$34,$37
128     DFB     $00
129     *
```


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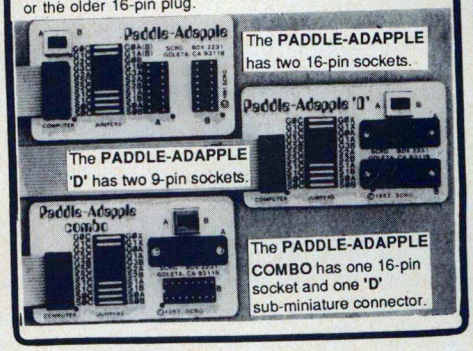
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COPY Command for ProDOS

Steven Ohmert

How many times have you been right in the middle of a programming activity only to find you need to transfer a program from another disk onto the one you are using? The ProDOS file perhaps? BASIC.SYSTEM? Your formatted data files from an old disk? An all-purpose STARTUP program? Did you have to stop what you were doing in order to use the ProDOS utilities, or move the file by awkwardly loading it from one disk and saving it to another? Don't you wish ProDOS had a COPY command?

The COPY Command

The ability to add new commands to ProDOS is one of it's most attractive features. COPY makes use of this interface, installing itself between ProDOS and its buffers. The syntax for this new command is: COPY [!] pathname1,pathname2 [,A{address] [,L{length] where pathname1 is the pathname of the file to copy from, and pathname2 is the name of the destination file. The items in [ ] brackets are options which we will discuss shortly.

An example for the command in its simplest form might be:

```
COPY/MYDISK/PROGRAM,/DISK2/
PROGRAM
```

This copies the file named PROGRAM from the volume /MYDISK/ to the volume /DISK2/.

Each of the volumes or subdirectories referenced by the command must be online when the command is given. No prompts will be made for changing disks. If the destination file exists, the prompt "File exists, replace?" will appear. Respond with "Y" for yes or "N" for no. If the destination file is locked, the prompt "File locked, replace anyway?" will be given. Again, Y or N are the allowed responses.

Should you reference a subdirectory file or the Volume Directory only, rather than an actual file name, the error FILE EXPECTED will be given.

The prefix portion of the pathname need not be used if the prefix has previously been set with the ProDOS PREFIX command, and the file you are referring to resides in the currently selected directory. Also, there is no reason why the destination file name must be the same as the first. For example,

```
COPY EXAMPLE,NEWFILE
```

copies the file named EXAMPLE from the currently defined prefix to the file named NEWFILE in the same prefix. However, if no prefix has been defined using PREFIX, a SYNTAX ERROR will result. Okay, now for the options. The "!" option disables the prompts mentioned above, replacing existing or locked files without asking. I have found this option to be especially useful when used in AppleSoft driven volume copy or backup programs that need to update old files often.

An example of the "!" option is:

```
COPY!/STUFF/MYFILE,/DISK2/MYFILE
```

This will copy the file MYFILE from /STUFF/ to /DISK2/ without replacement prompts.

The A and L keywords may be used to define the starting address and length of the copy buffer. By default, COPY will use the space it finds available between the top of array space and the start of strings from AppleSoft. This way, BASIC programs and variables are protected from being overwritten by the buffer. However, if this interferes with other memory in your programming, for example some hi-res graphics space, you may use the A and/or the L keywords to place the buffer where you wish. The address passed by the user must be on a page boundary (last 2 hex digits must be 00). If an address which is not on a page boundary is passed, the low order byte is ignored. The length of the buffer must be at least $500 (1280) bytes long. If the buffer starting address is out of range or if the buffer length is too large or small, the error "NO BUFFERS AVAILABLE" will be given as a result.

An example of all the options in force would be:

```
COPY! /MYDISK/PROGRAM,/DISK2/
PROGRAM,A$4000,L$1000
```

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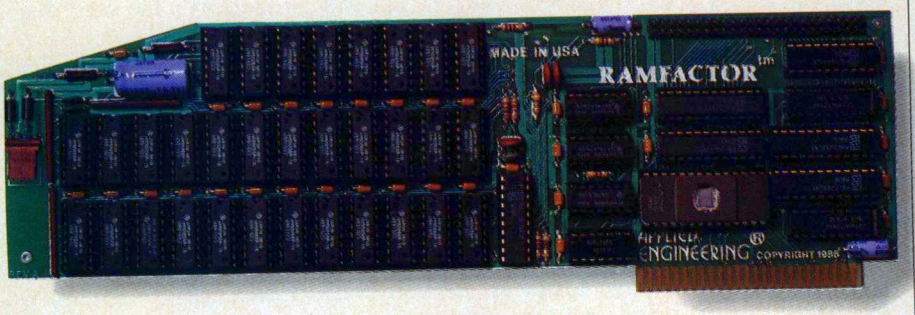

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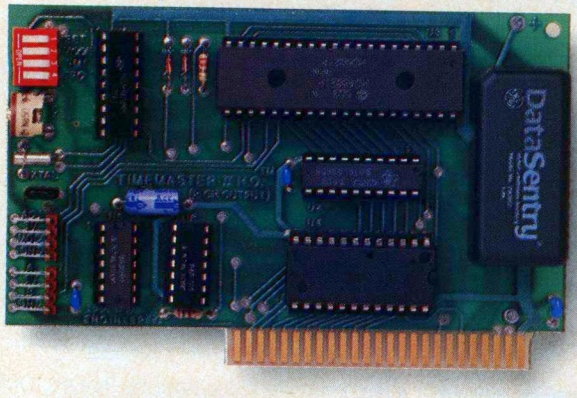
The first clock card to add time and date to AppleWorks'™ screens and files.



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CIRCLE 5 ON READER SERVICE CARD

This would copy the file PROGRAM from /MYDISK/ to /DISK2/ without prompting for replacing an existing or locked destination file, using a buffer $1000 bytes long beginning at $4000.

The Program

First, to give credit where it is due, I should mention that COPY is inspired by information and examples found in *Beneath Apple ProDOS,* by Don Worth and Pieter Lechner (Quality Software, Chatsworth, CA).

If you study the listing for the COPY command, you will notice that the first portion of the program installs the command handler beneath ProDOS and moves the ProDOS buffers down in memory. Space is allocated for the new command by using the GETBUFR routine ($BEF5). Those of you familiar with this routine know that by calling it with the desired number of pages to be allocated in the accumulator, the ProDOS Basic Interpreter will set aside this area and move down the AppleSoft HIMEM pointer accordingly. The high order byte of the first page of the new buffer (always on a page boundary) is returned in the accumulator. If an error occurred for any reason (such as not enough memory), the carry flag will be set.

The program then proceeds to relocate the resident portion of itself to the new address. Normally, if COPY is the first external command to be installed, it will reside at $9500-$9A00, leaving HIMEM at $9000. However, other external commands or other programs requesting buffers may have been installed prior to installation of COPY, so the command is designed to be relocatable so that it can be used without interfering with other external operations. Notice that the address found in the vector EXTCMD ($BE07-$BE08) is saved, and then reset to point to our command handler. The original address will be called in the event the command given is not ours. In this way, multiple external commands can be daisy chained together.

Once a command is given, and the BI fails to find it in its internal list of ProDOS commands, program control vectors through EXTCMD to our handler. It scans the command line passed by the BI for our command name. It also checks for the optional "!" character which may follow the name itself. If it is not our command, the carry is set and we perform a JMP to the next external command handler.

If it is our command, the syntax for the passed parameters is checked by storing appropriate values in two bytes known as PBITS ($BE54-$BE55), whose bit settings represent which options are and are not allowed within a command. We then return control to the BI to do the parsing for us.

Table 1 lists the PBITS settings for the various options a command may have. In our case, we want two pathnames to be passed, and we want to allow the A and L keyword options. By combining the values we find in the table, we get $03 for the first byte and $90 for the second. If any other options are passed, the BI will respond with INVALID PARAMETER. We pass control back to the BI for parsing by putting the address of the next portion of our command handler (COPYZ) into the vector XTADDR ($BE50-$BE51), clearing the carry flag, and performing an RTS back to the Basic Interpreter.

When we regain control (assuming no syntax errors were found by the BI), we need to check the values in FBITS ($BE56-$BE57). These two bytes contain the bit representations of which parameters were actually found within the command. Here, we first must determine that both pathnames

have been passed, not just one. Then we check for the presence of the A or L keywords, and accept the values we find there (refer to the second portion of Table 1 for a list of addresses where the various keyword values are stored). If these are not present, we assign the default buffer, which is the free space found between the top of AppleSoft arrays and the beginning of string memory.

Now we are ready to begin the actual copy. As you look through the listing, you will notice that there are special provisions made for random access text files. This is because such files may be what are known as "sparse" files. A random access file may contain data in records 10 and 2000, but nothing in between. That leaves 1990 records unfilled. ProDOS does not allocate disk space for these unused areas of the file until that section of the file is written to. In this way, a very large file may reside on a volume while actually using only a few disk blocks. If these files were copied in the "normal" fashion, that is, read from the source file and written to the destination file exactly as read, then the entire file length would be allocated even though the blocks being written contained all zeroes. To avoid this, COPY looks for random access text files and writes them differently, setting the End Of File (EOF) marker forward to skip over unused areas (zeroes).

This process extends the EOF marker to the correct position, but does not allocate additional data blocks. Aside from this exception concerning random access text files, the copy process is as follows: The source file information is read into memory and saved for later. A buffer's worth (or as much as possible) of data from the source file is read into memory. The source file information is compared against the destination file, if there is one. Errors, should they exist, are reported by calling ERROUT with the error number in the accumulator. If the prompts are not disabled, the user is prompted to replace the file, and if the destination file is locked, prompted again. If the file does not already exist, it is created. The first buffer's worth of data is written out, and the process of reading data from the source and writing it to the destination file begins. When all of the data from the source file has been read, a subsequent read operation will return an END OF DATA (error code=5) error. At this point, the destination file is updated with the information previously retrieved from the source file, both files are closed, and the process is complete.

Notice the operation of the GOSYSTEM call made throughout the program. Most MLI (Machine Language Interface) operations can be handled through this routine. The proper parameter lists within the BI Global Page must be set up for the correct command, and then a call is made to the GOSYSTEM subroutine (see Table 2). The carry will be set if there is an error, and the Basic Interpreter error code will be in the accumulator. A JMP to ERROUT will then print the appropriate ProDOS error message.

Modifications

A few modifications for embellishing this command come to mind. For one, single drive users would probably like to be prompted to change disks. This is fairly tricky, actually, since ProDOS will not allow you to maintain open files on two separate volumes on the same device. A process for accomplishing this type of copy might be this: The source file is opened, and a buffer's worth is read in. The current file position is saved, and then the source file is closed. The user would then be prompted to change disks. The destination file

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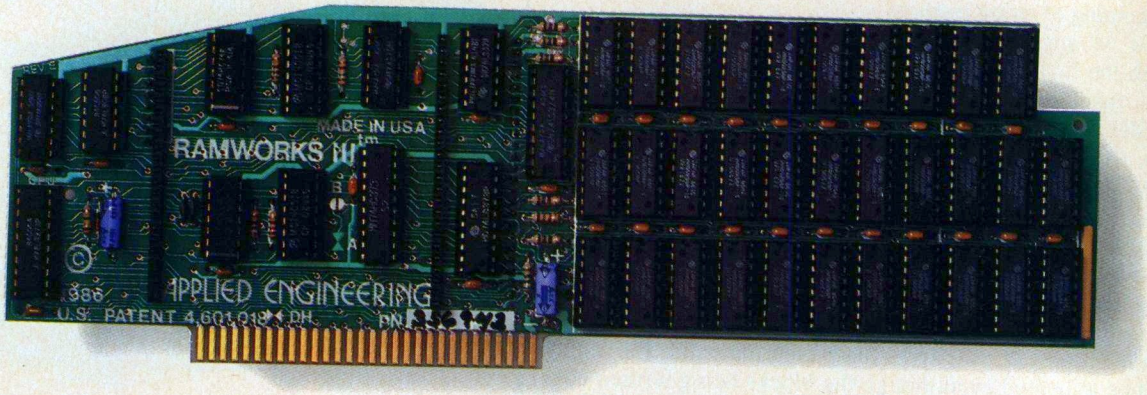

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RamWorks III is the newest 3rd generation RAM card for the Apple IIe. It incorporates all of the technology and improvements that years of experience and over a hundred thousand sales have given us. By selling more memory cards than anyone else and listening to our customers, we were able to design a memory card that has the ultimate in performance, quality, compatibility and ease of use. A design so advanced it's patented. We call it RamWorks III, you'll call it awesome!

The AppleWorks Amplifier.

While RamWorks III is recognized by all memory intensive programs, NO other expansion card comes close to offering the multitude of enhancements to AppleWorks that RamWorks III does. Naturally, you'd expect RamWorks III to expand the available desktop, after all Applied Engineering was a year ahead of everyone else *including Apple* in offering more than 55K, and we still provide the largest AppleWorks desktops available. But a larger desktop is just part of the story. Look at all the AppleWorks enhancements that even Apple's own card does not provide and *only* RamWorks III does. With a 256K or larger RamWorks III, *all* of AppleWorks (including printer routines) will automatically load itself into RAM dramatically increasing speed by eliminating the time required to access the program disk drive. Switch from word processing to spreadsheet to database at the speed of light with no wear on disk drives.

Only RamWorks eliminates AppleWorks' internal memory limits, increasing the maximum number of records available from 1,350 to over 25,000. *Only* RamWorks increases the number of lines permitted in the word processing mode from 2,250 to over 15,000. And *only* RamWorks offers a built-in printer buffer, so you won't have to wait for your printer to stop before returning to AppleWorks. RamWorks even expands the clipboard. And auto segments large files so they can be saved on two or more disks. You can even have Pinpoint or MacroWorks and your favorite spelling checker in RAM for instant response.

RamWorks, nothing comes close to enhancing AppleWorks so much.

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RamWorks III is compatible with all Apple IIe's, enhanced, unenhanced, American or European versions.

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Applied Engineering has always offered the largest memory for the IIe and RamWorks III continues that tradition by expanding to 1 full MEG on the main card using standard RAMs, more than most will ever need (1 meg is about 500 pages of text)...but if you do ever need more than 1 MEG, RamWorks III has the widest selection of expander cards available. Additional 512K, 2 MEG, or 16 MEG cards just snap directly onto RamWorks III by plugging into the industry's only low profile (no slot 1 interference) fully decoded memory expansion connector. You can also choose non-volatile, power independent expanders allowing permanent storage for up to 20 years.

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If you've got some other RAM card that's not being recognized by your programs, and you want RamWorks III, you're in luck. Because all you have to do is plug the memory chips from your current card into the expansion sockets on RamWorks to recapture most of your investment!

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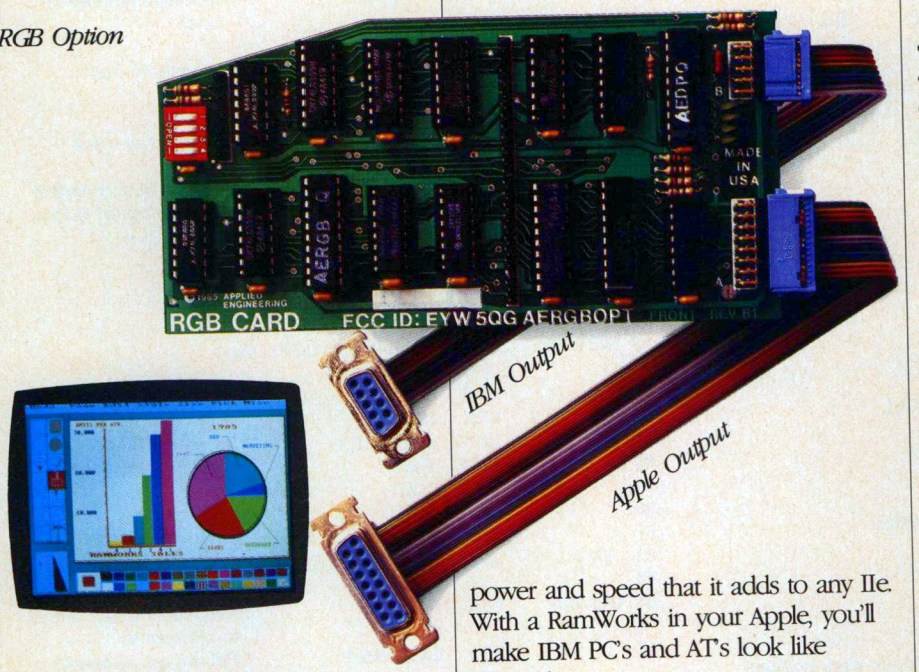
RGB color is an option on RamWorks and with good reason. Some others combine RGB color output with their memory cards, but that's unfair for those who don't need RGB *and* for those that do. Because if you don't need RGB

Applied Engineering doesn't make you buy it, but if you want RGB output you're in for a nice surprise because the RamWorks RGB option offers better color graphics plus a more readable 80 column text (that blows away any composite color monitor). For only $129 it can be added to RamWorks giving you a razor sharp, vivid brilliance that most claim is the best they have ever seen. You'll also appreciate the multiple text colors (others only have green) that come standard. But the RamWorks RGB option is more than just the ultimate in color output because unlike others, it's fully compatible with all the Apple standards for RGB output control, making it more compatible with off-the-shelf software. With its FCC certified design, you can use almost any RGB monitor because only the new RamWorks RGB option provides both Apple standard and IBM standard RGB outputs (cables included). The RGB option plugs into the back of RamWorks with no slot 1 interference and remember you can order the RGB option with your RamWorks or add it on at a later date.

RGB Option



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RamWorks III has a built-in 65C816 CPU port for direct connection to our optional 65C816 card. The only one capable of linearly addressing more than 1 meg of memory for power applications like running the Lotus 1-2-3™ compatible program, VIP Professional. Our 65C816 card does not use another slot but replaces the 65C02 yet maintains full 8 bit compatibility.

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A+ magazine said "Applied Engineering's RamWorks is a boon to those who must use large files with AppleWorks...I like the product so much that I am buying one for my own system." inCider magazine said "RamWorks is the most powerful auxiliary slot memory card available for your IIe, and I rate it four stars...For my money, Applied Engineering's RamWorks is king of the hill."

"I wanted a memory card for my Apple that was fast, easy to use, and very compatible; so I bought RamWorks."

Steve Wozniak, the creator of Apple Computer

Apple experts everywhere are impressed by RamWorks's expandability, versatility, ease of use, and the sheer power and speed that it adds to any IIe. With a RamWorks in your Apple, you'll make IBM PC's and AT's look like slowpokes.

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RamWorks III is from Applied Engineering, the largest, most well supported manufacturer of Apple peripherals and the inventor of large RAM cards for the Apple. With our 5 year no hassle warranty and outstanding technical support, you're assured of the most trouble free product you can buy.

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- Accelerates AppleWorks
- Built-in AppleWorks printer buffer
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is then opened, and written to. Its position is saved, then the file is closed. Subsequent reads/writes would involve prompting for the appropriate disk, opening the desired file, using the SET_MARK call to position the file marker where it left off before, reading or writing to or from the buffer, saving the new file position, and closing the file. This loop would continue until all the data had been copied. This process is somewhat longer and more cumbersome than the method COPY uses, but certainly worth working on if you have a single disk drive.

Another somewhat simpler modification would be to allow COPY to use the default drive even if a PREFIX command had not been issued. This can be accomplished by examining the default slot and drive values found in locations $BE3C and $BE3D, respectively, issuing an ONLINE call to return the name of the volume mounted there, and using this as the prefix.

More major modifications might allow global copy operations that would have the command handler reading the volume directory and copying all files of a certain type, or by wildcard name selection.

Use COPY as a model for your own commands too, and have fun!

Please rate this article on the Reader Service Card by circling:
81 Excellent **82** Good **83** Fair **84** Poor

```
1
2
3     COPY
4
5     A ProDOS External Command
6
7
8     By Steven Ohmert
9
10
11
12
13  * Syntax allowed:
14  *
15  * COPY[!] path1,path2 [,A{address}] [,L{length}]
16
17  * The "!" option disables prompts warning of
18  * existing files and/or locked files
19
20  * The "A" & "L" keywords may be used to define
21  * a buffer area other than the default area
22  *
23
24
25  PTR0      EQU   $00
26  PTR1      EQU   $02          ; Zpage work pointers
27  TEMP      EQU   $04
28
29  CH        EQU   $24
30  STREND    EQU   $6D          ; Top of array storage
31  FRETOP    EQU   $6F          ; Bottom of string storage
32  HIMEM     EQU   $73          ; HIMEM; location of Gen.
                                   Pur. I/O buffer
33
34
35  BIENTRY   EQU   $BE00        ; Warm start ProDOS BI
36  EXTCMD    EQU   $BE07        ; External command
                                   vector
37  ERROUT    EQU   $BE09        ; Exit w/error
38
39  XTADDR    EQU   $BE50        ; Executing address of
                                   external command
40  XLEN      EQU   $BE52        ; length of cmd string -1
41  XCNUM     EQU   $BE53        ; BI command number
42
43  PBITS     EQU   $BE54        ; Allowed parameter bits
44  FBITS     EQU   $BE56        ; Parameters found bits
45
46  ADDRVAL   EQU   $BE58        ; "A" keyword value
47  LENVAL    EQU   $BE5F        ; "L" keyword value
48
49  VPATH1    EQU   $BE6C        ; address of pathname #1
50  VPATH2    EQU   $BE6E        ; address of pathname #2
51
52  GOSYSTEM  EQU   $BE70  ; MLI call handler
53
54  CRTPRMS   EQU   $BEA0        ; Create parm list
55
56  SGINFO    EQU   $BEB4        ; Get/Set info parm list
57
58  SETPRMS   EQU   $BEC6        ; Set/Get Mark & EOF list
59  SETREF    EQU   $BEC7        ; Reference # for set/get
60  FILECNT   EQU   $BEC8        ; Passed/returned mark
                                   length
61
62  OPNPRMS   EQU   $BECB        ; Open parm list
63  OPNBUFR   EQU   $BECE        ; file buffer address
64  OPNREF    EQU   $BED0        ; open file reference
                                   number
65
66  RWREF     EQU   $BED6        ; place to put open ref
                                   number
67  RWBUFR    EQU   $BED7        ; address of data buffer
68  RWLEN     EQU   $BED9        ; requested length
69
70  CLSREF    EQU   $BEDE        ; reference number for
                                   close
71
72  GETBUFR   EQU   $BEF5        ; Allocate BI buffer
73
74
75  GETKEY    EQU   $FD0C        ; Monitor key input
                                   routine
76  COUT      EQU   $FDED        ; Monitor output routine
77  CROUT     EQU   $FD8E        ; Carriage return output
78
79
80
81            ORG   $2000
82
83  INSTALL   LDA   #>COPYEND-COPY+$100
84            JSR   GETBUFR      ; Get room
85            BCC   GOTBUF
86            LDX   #00
87  :LP       LDA   NOROOM,X
88            BEQ   :EXIT
89            JSR   COUT
90            INX
91            BNE   :LP
92  :EXIT     JMP   BIENTRY
93
94  GOTBUF    STA   PTR1+1       ; Requested buffer = area
                                   to relocate to
95            LDX   EXTCMD+1     ; Get old ext. vector in
                                   case it's used
96            STA   EXTCMD+1     ; Replace it w/ ours
97            STX   NEXTCMD+2    ; Put old vector in
address
                                   after JMP
98            LDX   EXTCMD       ; instruction of NEXTCMD
99            STX   NEXTCMD+1
100           LDY   #00
101           STY   PTR1
102           STY   EXTCMD
103
104 * Now relocate resident code to its new home
105
106           STY   PTR0
107           LDA   #>COPY
108           STA   PTR0+1       ; Set pointer to move
from
109 RELCT     LDA   (PTR0),Y     ; Get an opcode
110           STA   (PTR1),Y     ; move it to new location
```

```
111              STY   TEMP
112              PHA                    ; Now check address to
                                          relocate:
113              AND   #$03             ; Get bit offset of opcode
114              TAY
115              PLA
116              LSR                    ; divide by 4 for byte
                                          offset
117.             LSR
118              TAX
119              LDA   OPTAB,X          ; Get length byte from
                                          table
120 OPLOOP       DEY
121              BMI   OPDONE           ; Throw out unnessecary
                                          bits
122              LSR
123              LSR
124              BNE   OPLOOP
125 OPDONE       AND   #$03             ; Get the length now (2
                                          bits)
126              BEQ   COPIED           ; FF (only one w/0 length)
                                          means end reached
127              TAX                    ; This is length
128              LDY   TEMP             ; OK, where were we?
129              CPX   #3               ; If 2 more bytes (besides
                                          opcode, above)
130              BEQ   RELOC            ; Then get LSB and adjust
                                          MSB of address
131              INY
132              DEX                    ; Otherwise, do we
                                          have more?
133              BEQ   RELCT            ; No, this instruction done
134              LDA   (PTR0),Y ;       Yep, but no reloc. needed
                                          here
135STMSB          STA   (PTR1),Y         ; Put this byte in new area
136              INY
137              TYA
138              CLC
139              ADC   PTR0             ; Add # of bytes
                                          processed to pointers
140              STA   PTR0
141              BCC   :DO2
142              INC   PTR0+1
143 :DO2         TYA
144              CLC
145              ADC   PTR1
146              STA   PTR1
147              BCC   :DO3
148              INC   PTR1+1
149 :DO3         LDY   #00              ; Reset Y and loop
150              BEQ   RELCT
151
152
153RELOC           INY                 ; Address found, so
                                          process it
154              LDA   (PTR0),Y
155              STA   (PTR1),Y         ; LSB need not relocate
156              INY
157              LDA   (PTR0),Y
158              CMP   #>COPY           ; Within our page?
159              BLT   STMSB            ; No, don't relocate
160 CMP          #>COPYEND
161              BEQ   :OK
162              BGE   STMSB            ; If beyond our code, use
                                          as-is
163 :OK          SEC
164              SBC   #>COPY           ; Subtract original start
                                          address
165              CLC
166              ADC   EXTCMD+2         ; Add to new one
167 BNE          STMSB                  ; (always taken) Store
                                          adjusted MSB
168
169 COPIED       RTS                    ; All relocated, COPY is
                                          installed
170
171
172 NOROOM       ASC   "No room for new command!",87,00
```

```
173
174
175
176 * Each byte in the following table contains the lengths of
177 * 4 6502 instructions, (4 2-bit length values per byte)
178 * the position in the table represents the opcode/4
179
180 OPTAB       HEX   5969597D
181              HEX   5A695D7D
182              HEX   5B6A597F
183              HEX   5A695D7D
184              HEX   5969597F
185              HEX   5A695D7D
186              HEX   5969597F
187              HEX   5A695D7D
188              HEX   596A557F
189              HEX   5A6A5D5D
190              HEX   6A6A597F
191              HEX   5A6A5D7F
192              HEX   5A6A597F
193              HEX   5A695D7D
194              HEX   5A6A597F
195              HEX   5A695D3D
196
197
198              DS    \
199
200
201 COPY         CLD
202              LDA   VPATH1           ; Search command line
                                          for our command
203              STA   PTR0
204              LDA   VPATH1+1
205              STA   PTR0+1
206              LDY   #1
207 :CHKCMD      LDA   (PTR0),Y
208              CMP   CPYNAME,Y
209              BNE   NOPE
210              INY
211              CPY   CPYNAME
212              BNE   :CHKCMD
213
214              * Check for optional "!" to disable prompts
215
216              INY
217              LDA   #00
218              STA   PMTFLG
219              LDA   (PTR0),Y
220              CMP   #'!'
221              BNE   :NODIS
222              INY
223              DEC   PMTFLG           ;Set flag to disable
                                          prompts
224 :NODIS       DEY
225              DEY
226              STY   XLEN             ; Pass BI length of our
                                          command
227              LDA   #00
228              STA   XCNUM            ; Set command #
                                          (0=external)
229              LDA   #$03             ; Path1 and 2 required
230              STA   PBITS
231              LDA   #$90             ; A & L keywords OK
232              STA   PBITS+1
233
234 :LOC         LDA   COPYZ            ; (LDA opcode used to
                                          allow relocation)
235              LDA   :LOC+1           ; Point to our handler
                                          (COPYZ)
236              STA   XTADDR
237              LDA   :LOC+2
238              STA   XTADDR+1
239              CLC
240              RTS                    ; RTS to BI for command
                                          parsing
241
242RAFLAG          HEX   00
243PMTFLG          HEX   00
244
```

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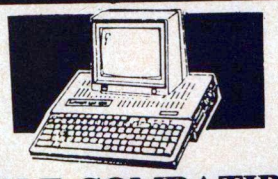

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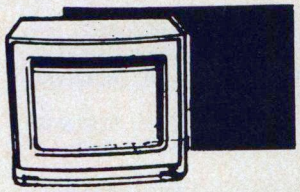

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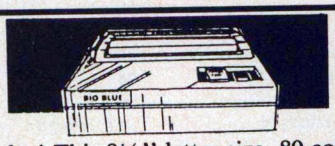

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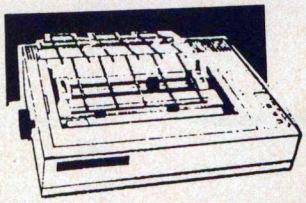

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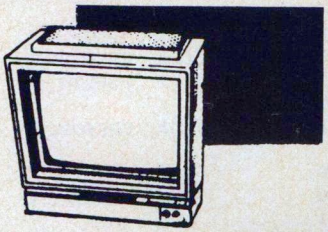
The Comstar Aero 160 gives you a 10'' carriage, 150-170 CPS, 9x9 dot matrix with double strike capability for 18x18 dot matrix (*near letter quality), high resolution bit image (120x144 dot matrix), underline, back spacing, left and right margin setting, true lower descenders with super and subscripts, prints standard, block graphics and special characters. It gives you print quality and features found on printers costing twice as much! (Centronics Parrallel Interface) List $499.00 **SALE $199.00** (*with Xetec interface)



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CIRCLE 21 ON READER SERVICE CARD

```
245NOPE      SEC
246NEXTCMD   JMP   $0000
247
248
249          COPYZ                    LDA   FBITS
250          AND   #3
251          CMP   #3                 ; Both names?
252          BEQ   :OK
253          LDA   #$10               ; Syntax Error
254          JMP   CMDERR
255
256:OK       LDA   FBITS+1
257          AND   #$80               ; Check for "A" keyword
258          BNE   :GETA              ; It's there -> get value
259          LDA   STREND+1           ; Default to the page
                                        boundary
260          CLC                      ; above Applesoft array
                                        space
261          ADC   #1
262          BNE   :SETA
263 GETA     LDA   ADDRVAL+1          ; Value passed by user
                                        (hibyte)
264          CMP   STREND+1
265          BLT   :BADL              ; Address passed is below
                                        arrays
266          BEQ   :BADL
267          CMP   FRETOP+1
268          BGE   :BADL              ; Address passed is
                                        above
                                        start of strings
269 :SETA    STA   BUFSTRT+1          ; This is start of buffer
270          LDA   #00
271          STA   BUFSTRT            ; Must be on page
                                        boundary
272
273          LDA   FBITS+1
274          AND   #$10               ; Look for "L" keyword
275          BNE   :GETL              ; It's there -> get value
276          LDA   FRETOP
277          STA   BUFLEN             ; Default length is
                                        beginning of
278          LDA   FRETOP+1           ; Applesoft string space
                                        top of
279          SEC                      ; arrays
280          SBC   BUFSTRT+1
281          BEQ   :BADL
282          BCS   :SETL
283 :BADL    LDA   #$0C               ; No buffers available
284          JMP   CMDERR
285 :GETL    LDA   LENVAL
286          STA   BUFLEN
287          LDA   LENVAL+1
288          TAX
289          CLC
290          ADC   BUFSTRT+1          ; Insure buffer is
                                        not too big
291          CMP   FRETOP+1
292          BGE   :BADL
293          TXA
294 :SETL    STA   BUFLEN+1
295          CMP   #5                 ; Must be at least $500
                                        long
296          BLT   :BADL
297
298
299 * BI is set up to read source file
300
301 :GETSRC   LDA   #10               ; Set parameter count for
                                        Get Info cmd
302          STA   SGINFO             ; Use gen. purpose parm
                                        lists from BI
303          LDA   #$C4               ; Get Info command code
304          JSR   GOSYSTEM           ; BI control for MLI
305          BCC   SAVINFO
306          JMP   CMDERR             ; Send error through
                                        ERROUT
307
308 SAVINFO  LDX   #17                ; Save this information
                                        from source file
309 :INFO    LDA   SGINFO,X
310          STA   SRCINFO,X
311          DEX
312          BNE   :INFO
313
314          LDA   SGINFO+4
315          CMP   #$0F               ; Check for directory
                                        file type
116          BNE   NOTDIR
317 FILEXPC  LDX   #FILEXPT-PROMPTS
318          JSR   LINEOUT            ; Say "File expected"
319          JMP   ABORT              ; Exit command
320
321 NOTDIR   CMP   #$04                ; Text file?
322          BEQ   :ISTXT
323          LDA   #00
324          BEQ   :NOTRA
325:ISTXT    LDA   SGINFO+5           ; Check record length
326          ORA   SGINFO+6           ; to determine if Random
                                        Access
327          BEQ   :NOTRA
328          LDA   #$FF
329:NOTRA    STA   RAFLAG             ; Setflag for Random
                                        Access file
330
331          LDA   HIMEM+1            ; Get address of General
                                        Purpose buffer
332          STA   OPNBUFR+1          ; Use this as ref buffer
                                        for file 1
333          LDA   #00
334          STA   OPNBUFR
335          LDA   VPATH1             ; Use pathname 1
336          STA   OPNPRMS+1
337          LDA   VPATH1+1
338          STA   OPNPRMS+2
339          LDA   #$C8               ; Open command
340          JSR   GOSYSTEM
341          BCC   OPNOK
342          JMP   CMDERR
343:OPNOK    LDA   OPNREF             ; Get ref # for this file
344          STA   REF1
345          STA   SETREF
346
347          LDA   #$D1               ; Get EOF of source file
348          JSR   GOSYSTEM
349          BCC   :EOF1
350          JMP   CMDERR
351:EOF1     LDA   FILECNT
352          STA   SRCEOF
353          LDA   FILECNT+1
354          STA   SRCEOF+1
355          LDA   FILECNT+2
356          STA   SRCEOF+2
357
358          JSR   SRCREAD            ; Read in source file
                                        to buffer
359
360:GETDST   LDA   VPATH2
361          STA   SGINFO+1
362          LDA   VPATH2+1
363          STA   SGINFO+2           ; Point to other pathname
364          LDA   #$C4               ; Get Info about
                                        destination file
365          JSR   GOSYSTEM
366          BCC   GETDEST
367          CMP   #$07               ; File not found?
368          BEQ   :MAKEIT
369          JMP   CMDERR
370
371:MAKEIT    LDA   VPATH2
372          STA   CRTPRMS+1
373          LDA   VPATH2+1
374          STA   CRTPRMS+2          ; Creat destination file
375          LDA   #$C3               ; Full access
376          STA   CRTPRMS+3
377          LDA   #1
378          STA   CRTPRMS+7
379          LDX   #2
```

```
380:LP          LDA   SRCINFO+4,X      ; Info for file to  start with
381             STA   CRTPRMS+4,X
382             LDA   SRCINFO+14,X
383             STA   CRTPRMS+8,X
384             DEX
385             BPL   :LP
386             LDA   SRCINFO+17
387             STA   CRTPRMS+11
388             LDA   #$C0
389             JSR   GOSYSTEM        ; Create it
390             BCC   OPNDEST
391
392CMDERR      JSR   RSTRPTH
393             JMP   ERROUT
394
395
396 GETDEST     LDA   SGINFO+4        ; Get file type of existing
                                        dest  file
397             CMP   SRCINFO+4       ; Is  it  the  same  as  the
                                        source file?
398             BEQ   :OK2            ; Yes
399             CMP   #$0F            ; No, is  it  a  directory?
400             BNE   MM
401             JMP   FILEXPC
402 :MM         LDA   #$0D            ; BI error: "FILE TYPE
                                        MISMATCH"
403             BNE   CMDERR
404
405 OK2        LDA   PMTFLG          ; Are prompts disabled?
406             BNE   OK3
407             JSR   REPLC1          ; Say "File exists,
                                        replace?"
408             BCS   ABORT           ; Answered no, so quit
409
410 OK3        LDA   SGINFO+3        ; Get access bits
411             AND   #$C3
412             CMP   #$C3            ; See if locked
413             BEQ   OPNDEST
414             LDA   PMTFLG
415             BNE   UNLOCK
416             JSR   REPLC2          ; Say"Filelocked, replace
                                        anyway?
417             BCC   UNLOCK
418 ABORT      CLC
419             JSR   RSTRPTH
420             JMP   CROUT
421
422 UNLOCK     LDA                   #7
423             STA   SGINFO          ; Parm count for set info
424             LDA   #$C3            ; Give full access
425             STA   SGINFO+3
426             JSR   GOSYSTEM        ; Unlockdestination file
427
428 OPNDES     LDA   BUFSTRT+1
429             STA   OPNBUFR+1
430             LDA   BUFSTRT
431             STA   OPNBUFR
432             LDA   VPATH2          ; Use pathname2
433             STA   OPNPRMS+1
434             LDA   VPATH2+1
435             STA   OPNPRMS+2
436             LDA   #$C8
437             JSR   GOSYSTEM        ; Open file 2
                                        using address as  buffer
438             BCS   CMDERR
439             LDA   OPNREF
440             STA   REF2
441
442
443             LDA   RAFLAG          is it a random access file?
444             BEQ   :WRT            ;no
445             LDA   #00
446             STA   FILECNT
447             STA   FILECNT+1
448             STA   FILECNT+2
449             LDA   REF2
450             STA   SETREF
451             LDA   #$D0            ; Set EOF to zero to free
                                        blocks  in  use
452             JSR   GOSYSTEM
453             BCC   :WRT
454             JMP   CMDERR
455
456 :WRT        JSR   DESTWRT         ; Write buffer  to
                                        destination file
457
458
459 COPYLP      JSR   SRCREAD         ; Read and Write until
done
460             JSR   DESTWRT
461             JMP   COPYLP
462
463
464 * Read source  file  nto buffer
465
466 SRCREAD     LDA   BUFSTRT
467             STA   RWBUFR
468             LDA   BUFSTRT+1
469             CLC
470             ADC   #$04            ; Past file/O buffer
471             STA    RWBUFR+1       ; Point to data buffer
472             LDA                   BUFLEN
473             STA   RWLEN
474             LDA                   BUFLEN+1
475             SEC
476             SBC   #4              ; Less file buffer
                                        allocation
477             STA                   RWLEN+1
478             LDA                   REF1
479             STA                   RWREF
480             LDA   #$CA            ; Read command code
481             JSR   GOSYSTEM
482             BCC   :OK
483             TAX                   ; Put A away for moment
484             PLA
485             PLA                   ; Pull RTS from stack
486             TXA
487             CMP   #5              ; End of data?
488             BEQ   :DONE
489             JMP   CMDERR
490
491 OK          RTS
492
493
494* Update destination file and  exit  command
495
496
497:DONE       LDA   SRCEOF          ; Set EOFof random
                                        access file
498             STA   FILECNT         ; equal to that of the
                                        sourcefile
499             LDA   SRCEOF+1
500             STA   FILECNT+1
501             LDA   SRCEOF+2
502             STA   FILECNT+2
503
504             LDA   REF2
505             STA   SETREF
506             LDA   #$D0
507             JSR   GOSYSTEM
508             BCC   :DONE2
509             JMP   CMDERR
510
511 :DONE2      LDX   #17             ; Recall source info
512 :CPYINFO    LDA   SRCINFO,X
513             STA   SGINFO,X
514             DEX
515             BNE   :CPYINFO
516             LDA   VPATH2          ; Put this info on new file
517             STA   SGINFO+1
518             LDA   VPATH2+1
519             STA   SGINFO+2
520             LDA   #7
521             STA   SGINFO          ; Parm count
522             LDA   #$C3
523             JSR   GOSYSTEM
524             BCC   :BYE
525             JMP   CMDERR
```

```
526:BYE          JMP   ABORT              ; COPY completed
527
528* Write to destination file
529
530
531 DESTWRT    LDA   REF2               ; Refer to destination file
532`           STA   RWREF
533            STA   SETREF
534
535            LDA    RAFLAG
536            BNE   DOBLKS             ; Do copy for random
                                          access files
537
538            LDA   RWLEN+2            ; Do normal copy
539            STA   RWLEN
540            LDA   RWLEN+3
541            STA   RWLEN+1            ; Write # of bytes read
last
542
543 WRT2DST    LDA   #$CB               ; Write buffer to file
544            JSR   GOSYSTEM
545            BCC   :OK
546            JMP   CMDERR
547:           OK    RTS
548
549* If file is random access, skip parts of buffer that are zero
550
551 DOBLKS     LDA   BUFSTRT
552            STA   PTR1
553            STA   PTR0
554            LDA   BUFSTRT+1
555            CLC
556            ADC   #4
557            STA   PTR1+1             ; Point to start of data
                                          buffer
558            STA   PTR0+1
559
560            LDA   BUFSTRT
561            CLC
562            ADC   BUFLEN
563            STA   ENDBUF             ; Establish end of buffer
                                          address
564            LDA   BUFSTRT+1
565            ADC   BUFLEN+1
566            STA   ENDBUF+1
567
568 :LP         LDY   #00                ; See if this section starts
                                          with
569            LDA   (PTR1),Y           ; zero or non-zero
570            BEQ   :CNT0
571
572
573* 1st byte was non-zero.find # of non-zero bytes here
574
575   :LP1      INC   PTR1               ; Move through buffer
                                          looking for zeroes
576            BNE   :INC1
577            INC   PTR1+1
578 :INC1      LDA   PTR1+1
579            CMP   ENDBUF+1           ; See if at end of buffer
580            BNE   :CHK1
581            LDA   PTR1
582            CMP   ENDBUF
583 :CHK1      BGE   :END1
584
585            LDA   (PTR1),Y           ; Look for a zero to end
                                          section
586            BNE    :LP1
587
588 :END1      LDA   PTR1
589            SEC
590            SBC   PTR0
591            STA   RWLEN
592            LDA   PTR1+1
593            SBC   PTR0+1
594            STA   RWLEN+1            ; Set # of bytes to write
595            LDA   PTR0
596            STA   RWBUFR
597            LDA   PTR0+1
598            STA   RWBUFR+1
599            JSR   WRT2DST            ; Write this section to
                                          destination file
600
601:ENDC        LDA   PTR1               ; Update PTR0 for
                                          counting
602            STA   PTR0
603            LDA   PTR1+1
604            STA   PTR0+1
605            CMP    ENDBUF+1          ; See if we are done with
                                          buffer
606            BNE   :CHK
607            LDA   PTR1
608            CMP   ENDBUF
609 :CHK2      BLT   :LP
610
611            RTS                      ; At end of buffer.data
                                          written
612
613 * 1st byte was zero.see how long an "empty" section there is
614
615 :CNT0      INC   PTR1               ; Move thru buffer, look
                                          for non-zero
616            BNE   :INC2
617            INC   PTR1+1
618 :INC2      LDA   PTR1+1
619            CMP   ENDBUF+1
620            BNE   :CHK3
621            LDA   PTR1
622            CMP   ENDBUF
623:CHK3       BGE   :END2
624
625            LDA   (PTR1),Y           ; Look for non-zero
626            BEQ   :CNT0
627
628 :END2      LDA   PTR1
629            SEC
630            SBC   PTR0
631            STA   PTR0
632            LDA   PTR1+1
633            SBC   PTR0+1
634            STA   PTR0+1
635
636            LDA    #$D1              ; Get current EOF mark
637            JSR   GOSYSTEM
638            BCC   :OK3
639            JMP   CMDERR
640 :OK3       LDA    FILECNT           ;;ncrease length by this
                                          amount
641            CLC
642            ADC   PTR0
643            STA   FILECNT
644            LDA   FILECNT+1
645            ADC   PTR0+1
646            STA   FILECNT+1
647            BCC   :NEWEOF
648            INC   FILECNT+2
649
650 :NEWEOF    LDA   #$D0
651            JSR   GOSYSTEM           ; Set EOF w/o writing
                                          data.this will
652            BCC   :OK                ; Leave empty blocks un-
                                          allocated
653            JMP   CMDERR
654 :OK        LDA   #$CE               ; Set mark to this position
                                          in file now
655            JSR   GOSYSTEM
656            BCC   :OK2
657 :OK2       JMP   :ENDC
659
660
661
662
663
664
665 CLOSE      LDA   REF2
666            STA   CLSREF
667            LDA   #$CC               ; Close file 2
668            JSR   GOSYSTEM
```

```
669             LDA   REF1
670             STA   CLSREF
671             LDA   #$CC              ; Close file 1
672             JMP   GOSYSTEM
673
674 RSTRPTH    PHA                     ; Put original pathname
                                        back as was
675             JSR   CLOSE             ; before handling
                                        command
676             LDA   VPATH1
677             STA   CRTPRMS+1
678             STA   SGINFO+1
679             STA   OPNPRMS+1
680             LDA   VPATH1+1
681             STA   CRTPRMS+2
682             STA   SGINFO+2
683             STA   OPNPRMS+2
684             CLC
685             PLA
686             RTS
687
688
689* Prompts and error messages:
690
691 REPLC1      LDX   #EXISTS-PROMPTS
692             JSR   LINEOUT
693             JMP   YESNO
69
695 REPLC2      LDX   #LOCKED-PROMPTS
696             JSR   LINEOUT
697
698 YESNO       JSR   GETKEY
699             PHA
700             JSR   COUT
701             PLA
702             AND   #$DF              ; Make upper case
703             CMP   #"Y"
704             BEQ   YES
705             CMP   #"N"
706             BNE   YESNO             ; Not yes or no
707             JSR   CROUT
708             SEC
709             RTS
710 YES         JSR   CROUT
711             CLC
712             RTS
713
714
715 LINEOUT     LDA   PROMPTS,X
716             BEQ   :OUT
717             JSR   COUT
718             INX
719             BNE   LINEOUT
720 :OUT        RTS
721
722 PROMPTS
723 FILEXPT     HEX   8D
724             ASC   "FILE EXPECTED",87,8D,00
725 EXISTS      ASC   "File exists, replace? ",87,00
726 LOCKED      ASC   "File locked, replace anyway? ",87,00
727
728 CPYNAME STR 'COPY'
729
730 REF1        HEX   00                ; Reference number for
                                        source file
731 REF2        HEX   00                ; Reference number for
                                        destination file
733 BUFSTRT     HEX   0000              ; Buffer tarting address
734 BUFLEN      HEX   0000              ; Length of buffer
735 ENDBUF      HEX   0000              ; Ending address of buffer
736
737 SRCEOF      HEX   000000            ; Area to save source file
                                        EOF mark
738
739 SRCINFO     DS    18                ; Area to save source file
                                        information
740
741 COPYEND     HEX   FF                ; Signal end of relocation
742
```

TABLE 1
PBITS/FBITS BIT ASSIGNMENTS

VALUE	BYTE 1	BYTE 2
$80	Prefix needed	A keyword allowed
$40	Slot # only	B keyword allowed
$20	Deferred command	E keyword allowed
$10	File name optional	L keyword allowed
$08	Create file	@ keyword allowed
$04	T keyword allowed	S or D keywords allowed
$02	Pathname 2 allowed	F keyword allowed
$01	Pathname 1 allowed	R keyword allowed

Addresses to find keyword values:

A	= $BE58	- $BE59	F	= $BE63	- $BE64
B	= $BE5A	- $BE5B	R	= $BE65	- $BE66
E	= $BE5D	- $BE5E	V	= $BE67	
L	= $BE5F	- $BE60	@	= $BE68	- $BE69
S	= $BE61		T	= $BE6A	
D	= $BE62				

TABLE 2
BASIC INTERPRETER PARAMETER LISTS

$BE70 = GOSYSTEM subroutine: Place MLI command code in the accumulator and JSR to this address Make sure the proper parameter list has been set up as you desire. BI error codes are returned in the accumulator with the carry flag set.

ADDRESS	USED FOR:
$BEA0 =	CREATE ($C0)
$BEAC =	DESTROY ($C1), SET_PREFIX ($C6), GET_PREFIX ($C7)
$BEAF =	RENAME ($C2)
$BEB4 =	SET_FILE_INFO ($C3), GET_FILE_INFO ($C4)
$BEC6 =	ONLINE ($C5), SET_MARK ($CE), GET_MARK ($CF), SET_EOF ($D0), GET_EOF ($D1), SET_BUF ($D2), GET_BUF ($D3)
$BECB =	OPEN ($C8)
$BED1 =	NEWLINE ($C9)
$BED5 =	READ ($CA), WRITE ($CB)
$BEDD =	CLOSE ($CC)

Note that the parameter count must be set for SET_FILE _INFO and GET_FILE_INFO since they each use different count values. Other commands can use the value in the parameter list by default. Note also that MLI commands numbered less than $C0 (such as read/write block for example) are not supported. These operations must be made directly through the MLI with errors handled separately.

The Spreadsheet Sheet

Working With Macros Part II

Jeffrey M. Jacques

Last time we noted how to work with THE Spreadsheet and AppleWorks Macros. Now we shall harness the power of third generation software and more fully explore the power of macros within the data management option of a spreadsheet program.

Service Record & Accounts Receivable

All of us who deal with the world of business have to be able to efficiently invoice our customers. While preparing and sending invoices does not insure our ability to collect, it is unlikely that we would ever collect outstanding bills if we did not send the invoices in a timely manner.

The macro discussed below assumes that you own a small auto repair business where you specialize in speedy oil change service. Additionally we assume that most of your customers pay cash and a few, say twenty to thirty, have a charge account with your company. Since most of those holding such an account are substantial customers, you give a discount to these customers when they use your company in volume–a discount of 15% for three, four or five serviced vehicles, a discount of 25% for six or more serviced vehicles. (Companies with less than three cars serviced get no discount.) Now, to make it a little more interesting, only those cars getting "full service" are counted towards this discount. Full service carries a price tag of $19.95 or more.

Finally, as part of your philosophy of doing business, you like to provide these customers with a service record of each vehicle. Since many of these customers own several vehicles, vehicle information and identification will have to be kept. Now, any spreadsheet program can be used to keep track of standard invoicing and service record transactions: i.e.,

1) DATE
2) CAR CHARACTERISTICS
   Make, year, license plate number, mileage,
3) CHARGED AMOUNT or PAYMENT/CREDIT AMOUNT

This information can be entered easily into the worksheet shown in Table 1. The body of the table, beginning in row 11, contains the essential transaction data. Column B is used to enter the date, columns C through E are used to enter car characteristics, column F is used to enter the amount of each transaction. Finally, column A is used in two ways. First, the charge number or transaction number may be entered. Secondly, PAYMENTs by account holders may be entered. Every transaction, therefore, will have either a transaction number that may be traced back to the original statement or a payment/credit identifier. For those not completely familiar with data entry when working with SuperCalc, most entries are made in the usual manner. Simply enter text or values and press the RETURN key. Sometimes, however, we need to treat text as though it were a value–e.g., when we wish to check the value with an logical function–IF statements. Super Calc provides us with this opportunity by allowing us to enter a character string of up to nine characters in length within quote and parenthesis indicators. The word PAYMENT was entered as ("PAYMENT"). While this may not seem important now, it will be shortly!

Finally, when it comes to data entry and powerful calendar functions, SuperCalc excels. Dates were entered with the

DATE(mm,dd,yy)

function. While the display may read:

9/ 1/1986

the cell entry is:

DATE(9,1,86)

and the cell contents,internally to SuperCalc, are:

31596.

While this value may appear mystical, it is not. Actually, it simply indicates the number of elapsed days since March 1, 1900 to the date specified within the DATE function. Thus, dates, when entered within the DATE function, may be used as an argument in any logical function (e.g., IF, AND, OR, etc.)

Now, let's return to our first goal of building a macro which will produce a service record for each vehicle owned by the same company. Since all vehicles owned by the same company are listed on their own worksheet with the essential data, then all we must do is to:

1. sort the data by car identifier,
2. sort within car identifier by mileage
3. differentiate between cars and payments/credits, and
4. print an appropriate report.

To illustrate this process we shall use the MAKE/YEAR column as the identifier and the primary sort key while we shall use the column labeled MILEAGE as the secondary sort key. The SupeCalc expression is:

/A(rrange),C(olumn),C(primary sort column),
11.254(rows),
A(scending),N(adjust No),
E(secondary sort column),
A(scending)RETURN

This command sequence will place all the cars identified in the same manner together. Of course cars with slightly different identifier labels (e.g., CHEVY and CHEVY-81) are treated as separate–non sequential–entries. (If you have given some thought to the worksheet, you might be wondering why I did not choose to sort on the column, LICENSE. In Florida, License tags change all too often. Thus, over the course of a year, the same car could have the tag REV-123 or 987-ABC. When sorted on this column, the same car might have its records listed at the beginning and at the end of the worksheet. I found it best, therefore, to sort on MAKE/YEAR identifier.)

A SuperCalc Macro Service Report

Now, let's consider how to construct a SuperCalc macro. First, clear your

TABLE 1a:
INITIAL WORKSHEET FOR SUPER CALC MACROPAGE

	A	B	C	D	E	F
1	ABC ELECTRIC				SPEEDY OIL SERVICE	
2	2415 Springhill Road				1234 Main Street	
3	Tallahassee, FL 32304				Tallahassee,Fl 32312	
4						
5	BEG .BILLING	9/1/1986				
6	END BILLING:	9/30/1986				
7	Balance:	$100.00				
8						
9	CHARGE#	DATE	MAKE/YEAR	LICENSE	MILEAGE	AMOUNT
10	==========	==========	==========	==========	==========	==========
11	CO23650	9/2/1986	BUICK	2A12474	112,619	22.42
12	CO24047	9/4/1986	CHEVY-81	2C-29008	32,575	19.90
13	PAYMENT	9/5/1986				40.00
14	CO24666	9/17/1986	BUICK	2A12474	123,700	19.95
15	CO29888	10/2/1986	BUICK	2A12474	135,125	20.44
16	CO25885	9/22/1986	CHEVY	2C-29008	45,231	19.95

TABLE 1c:
INITIAL WORKSHEET FOR
SUPERCALC3a MACROS

SUPERINV.CAL**Range< ALL> [A1:F16]
+FMT+VAL*
LEGEND: F Formula +Number "Text' Repeatb blan

	A	B	C	D	E	F
1	"				"	
2	"				"	
3	"				"	
4						
5	"	+				
6	"	+				
7	"	+				
8						
9	"	"	"	"	"	"
10	'					
11	"	+	"	"	+	+
12	"	+	"	"	+	+
13	+	+				+
14	"	+	"	"	+	+
15	"	+	"	"	+	+
16	"	+	"	"	+	+

TABLE 1b: INITIAL WORKSHEET FOR SUPERCALC3a MACRO BY CELL AND CONTENTS

	A	B	C	D	E	F
1	ABC ELECTRIC				SPEEDY OIL SERVICE	
2	2415 Springhill Road"				1234 MainStreet	
3	Tallahassee, FL 32304"				Tallahassee, Fl. 32312	
4						
5	BEG.BILLING:	UDATE(9,1,86)<31596>				
6	ENDBILLING:	UDATE(9,30,86)<31625>				
7	BALANCE:	(2)U100<100>				
8						
9	(TL)"CHARGE#	DATE	MAKE/YEAR	LICENSE	MILEAGE	AMOUNT
10	U					
11	U CO23650	U DATE(9,2,86)< 31597>	U"BUICK	U 2A12474	U112619<112619>	U22.42<22.420>>
12	U CO24047	UDATE(9,4,86)<31599>	U"CHEVY-81	U"2C-29008	U32575<32575>	U19.90<19.90>
13	U("PAYMENT")	UDATE(9,5,86)<31600>				U40<40>
14	U"CO24666	UDATE9,17,86)<31612>	U"BUICK	U"2A12474	U123700<123700>	U19.95<19.950>
15	U"CO29888	UDATE10,2,86)<31627>	U"BUICK	U"2A12474	U135125<135125>	U20.44<20.440>
16	U"CO25885	UDATE(9,22,86)<31617>	U"CHEVY	U"2C-29008	U45231<45231>	U19.95<19.950>

worksheet. Second, format column A to 50 or more characters. This is accomplished with:

/F(ormat),C(olumn),A,50

This wide column width will assure inclusion of the entire command sequence when you go to PRINT it to disk. Now, beginning in row 1, simply enter the keystrokes which will accomplish the macro instructions. Remember to enter a single double quote sign, " , before each command and two double quote signs for labels to be entered into each cell. See Table 2 for our simple sort macro and report sequence output.

Here's an explanation of what this sort sequence accomplished. First it deletes row 10. Thus there will be no blank rows between the field headings (e.g., CHARGE #, MAKE/YEAR, etc.) and the data (CO23650, BUICK, etc.). In column H we have entered the criterion field, CHARGE #, for this macro. Then we enter the expressions:

~("PAYMENT") in H10, and
~("CREDIT") in H11.

which indicates NOT ("PAYMENT") and NOT ("CREDIT").* Thus only charges–service to cars–will be included in this retrieval. These steps are accomplished in rows 2 through 7 and are important in defining the criterion for the retrieval. Next, we define the fields we shall wish to include in our output. In this example we shall include in the output area the fields of MAKE/YEAR, LICENSE, DATE, and MILEAGE. (Note the change of order in the display output area–a powerful feature of SuperCalc.) These commands are entered into rows 8 through 15.

TABLE 2a

SUPERCALC3a MACRO FOR PRODUCING SERVICE REPORT

	A	B
1	/DR10	Delete row 10
2	=H9	Set marker in cell H9
3	"CHARGE	Enter field name CHARGE # in cell
4	=H10	Set marker in cell H10
5	"~("PAYMENT")	Enter retrieval criterion NOT("PAYMENT")
6	=H11	Set marker to cell H11
7	"~("CREDIT")	Enter retrieval criterion NOT("CREDIT")
8	=J9	Set marker to cell J9
9	"MAKE/YEAR	Enter output field--MAKE/YEAR
10	=K9	Set marker to cell K9
11	"LICENSE	Enter output field--LICENSE
12	=L9	Set marker to cell L9
13	"DATE	Enter output field--DATE
14	=M9	Set marker to cell M9
15	"MILEAGE	Enter output field--MILEAGE
16	//DIA9.F250	Define data base input area
17	"	Null cell (") ends this data base command
18	//DCH9.H11	Define data base criterion region
19	"	Null cell (") ends this data base command
21	"	Null cell (") ends this data base command
22	//DE	Perform data base retrieval
23	/IR10	Insert a blank row at row 10
24	=A10	Place marker in cell A10
25	'=	Enter repeating label ==== in this cell
26	=J2	Place marker in cell J2
27	"SPEEDY OIL CHANGE SERVICE RECORD FOR:	Enter label
28	/CA1.A4,K4	Copy Names and addresses from cell A1 through A4 to block beginning with K4
29	/ACJ,11.250,AN,M,A	Sort the data base output file
30	/GB	Turn off border
31	/ODI1.M50,P	Send output to Printer for first 40 vehicles
32	/GB	Turn border back on

NOTE: When printing a macro to disk, just print column A. Furthermore, make sure the border is set to off before beginning to write your .XQT file to disk.

TABLE 2b

PRINTED OUTPUT AFTER MACRO EXECUTION

SPEEDY OIL CHANGE SERVICE RECORD FOR:
ABC ELECTRIC
2415 Springhill Road
Tallahassee, FL 32304

MAKE/YEAR	LICENSE	DATE	MILEAGE
BUICK	2A12474	9/ 2/1986	112619
BUICK	2A12474	9/17/1986	123700
BUICK	2A12474	10/ 2/1986	135125
CHEVY	2C-29008	9/22/1986	45231
CHEVY-81	2C-29008	9/4/1986	32575

TABLE 2c

SUPERCALC WORKSHEET AFTER MACRO EXECUTION

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	"ABC ELECTRIC				"SPEEDY OIL SERVICE								
2	"2415 Springhill Road				"1234 Main St.					"SPEEDY OIL CHANGE SERVICE REORD FOR:			
3	"Tallahassee, FL 32304				"Tallahassee, FL 32312								
4											"ABC ELECTRIC		
5	"BEG. BILLING: DATE(9,1,86)										"2415 Springhill Road		
6	"END BILLING: DATE(9,30,86)										"Tallahassee, FL 32304		
7	"BALANCE:: 100												
8													

9"	CHARGE #	"DATE"	MAKE/YEAR	"LICENSE	"MILEAGE	AMOUNT	"CHARGE#	"MAKE/YEAR	"LICENSE	"DATE"	.MILEAGE
10	==========	==========	==========	==========	==========	==========	==========	==========	==========	==========	==========
11	"CO23650	DATE(9,2,86)	BUICK	"2A12474	112619	22.42	"~("PAYMENT")	"BUICK	"2A12474	DVAL(31597)	12619
12	("PAYMENT	DATE(9,5,86)				40.00		BUICK	"2A12474	DVAL(31612)	123700
13	"CO24666	DATE(9,17,86)	"BUICK	"2A12474	123700	19.95		BUICK	"2A12474	DVAL(31627)	135125
14	"CO29888	DATE(10,2,86)	BUICK	"2A12474	135125	20.44		CHEVY	"2C-29008	DVAL(31617)	45231
15	"CO24047	DATE(9,4,86)	"CHEVY-81	"2C-29008	32575	19.90	~"(CHARGE")	"CHEVY-82	9008	DVAL(31599)	32575
16	"CO25885	DATE(9,22,86)	"CHEVY	"2C-29008	45231	19.95					

TABLE 2d

SUPERCALC WORKSHEET AFTER MACRO EXECUTION

LEGEND: F Formula + Number " Text ' Repeat b blank

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	"												
2	"				"					"			
3	"				"								
4											"		
5	"	+									"		
6	"	+									"		
7	"	+											
8													
9	"	"	"	"	"	"		"		"	"	"	"
10	'												
11	"	+	"	"	+	+		"		"	"	+	+
12	+	+				+				"	"	+	+
13	"	+	"	"		+	+			"	"	+	+
14	"	+		"	"	+	+			"	"	+	+
15	"	+	"	"	+	+				"	"	+	+
16	"	+	"	"	+	+							

Now, here's where the fun begins. Beginning in Row 16, we can use the SuperCalc data base functions. First, we define the input area, row 16; then the criterion region, row 18; and finally the output area, row 18. Finally, the command on row 21:

IIDE

or II–Data Management Extract will automatically transfer only the serviced vehicles from the input region to the output area. We then insert a blank line and redraw the repeating labels. Once accomplished, we can enter our header information, row 28, sort the serviced vehicles, row 29, and automatically print the report, row 31. Go ahead and study this macro. Think about just having to enter the command:

/X(execute),MACRO1

and have all this done for you for each account. Pretty neat. Go ahead and look again at the macro.

SuperCalc Macro—Invoicing Clients

Now that you have mastered the basics of using SuperCalc3a macro and data management facility, we can explore how to incorporate Data Base and spreadsheet functions to produce a monthly invoice via a complex macro.

Any good invoice should have the following information:

1. Client's name and address,
2. Beginning and Ending billing dates,
3. Outstanding balance,
4. Charges, date of charge and amount of charge,
5. Payments or credits, date of payment or credit and amount of pay-

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CIRCLE **13** ON READER SERVICE CARD

ment or credit,
6. Reference identifier or transaction information,
7. Total charges,
8. Discounts, if any, and
9. Amount of payment due

While you may wish to add other fields and information (e.g., description of what was charged, etc.), this list is sufficiently strong to serve our pedagogical needs. Okay, take a couple of minutes and think about what you would wish your output to look like. (You might look at your current invoices right now. They will probably look something like the template listed in Table 3a.) Go ahead and look at it now. You will note that it has all the essential information: Date, charge number/transaction code, the amount of the transaction. You will note too that it lists columns for CHARGES and CREDITS as well as a running BALANCE. While this template appears to have no values or equations in the body of the table, nothing could be further from the truth.

Since we know from our previous work the nature of each transaction, that is, if it was a charge or a payment, we can use a logical IF test to place the amount of the transaction in the appropriate column. The basic IF statement for the CHARGE column would read:

IF (C21=("PAYMENT"),0,D21)

and the basic IF statement for the CREDIT column would read:

IF (C21=("PAYMENT"),D21,0)

In the first case, if a ("PAYMENT") was listed under the CHARGE # column, then 0 dollars are listed in the CHARGE colum If the ("PAY MENT") identifier was list the amount of the payment would be displayed in the CREDIT column. Since other types of credits may be earned by the customer (e.g., discounts, return of items, etc.), I have included a second test case along with ("PAYMENT"). I call this simply ("CREDIT"). The basic IF expression becomes:

IF(OR(C21=("CREDIT"),C21=("PAYMENT")),D21,0)

Since typical posting machines will print a running balance, I thought that it would be useful to give you the ability to use the same structure. A running balance is computed using the basic idea of:

TABLE 3a INITIAL TEMPLATE FOR SUPERCALC3a INVOICE MACRO

	A	B	C	D	E	F	G	H
1								
2								
3								
4								
5	Statement from: SPEADY OIL SERVICE							
6	123 MAIN STREET (904) 555-1234							
7	Tallahassee, FL. 32301							
8								
9								
10		COMPANY NAME						
11		COMPANY ADDRESS						
12		COMPANY CITY, STATE, ZIP						
13								
14								
15	BILL BEGINS:					OLD BALANCE:		
16	BILL ENDS:							
17								
18								
19	DATE CHARGE #	AMOUNT CHARGES			FULL SER? CREDITS		BALANCE	
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								
41								
42								
43								
44								
45								
46								
47								
48								
49								
50								
51								
52	TOTAL CHARGES FOR THIS MONTH							00
53	TOTAL PAYMENTS AND CREDITS FOR THIS MONTH							00
54	CREDIT FOR FULL SERVICE--FOR: 0VEHICLES							00
55	BALANCE FORWARDED FROM PREVIOUS MONTH:							00
56								
57	TOTAL PAYMENT NOW DUE							00

OLD BALANCE+CHARGES - CREDITS

This converts to:

H15 + E21 - G21

for cell H21. Of course it's not quite this simple when you wish to control the way the data are displayed.

You have no doubt been wondering why the body of the table does not display a large number of 0 values. I used SuperCalc3a's user defined formating option to suppress all cells which have a value of zero. Now, this is no problem when you have no charges or credits. But running balances are rarely zero. So, I tested to see if the current cell balance is the same as the previous cell balance. When it is, a value of zero will be substituted. In cell H23, the expression is:

IF(H22=H21,0,H22+E23-G23)

Most of the remaining cells in column H are tested in the same manner. Two exceptions should be noted, however. First, in cell H21, our test is accomplished with the expression:

IF(B21=0,0,H15+E21-G21)

Since this is the first cell for the running balance, it is not surprising that I am simply checking to see if any transactions have taken place. When a transaction has taken place, the old balance value is referenced and the new balance is computed. Similarly, in cell H22, I check to see if the first balance entry is zero. Under most circumstances this will not be true. I, therefore, simply compute a new running balance with the expression:

IF(H21=0,0,H21+E22-G22)

Therefore, when there is no change (i.e., all the transactions for this month have been listed) from one row to the next row, a 0 value is entered into the cell and the user-defined format option suppresses any cell output. Now, that's spreadsheet power!

(Of course, you could have just as easily followed the format of the first cell in column H and checked to see if a transaction took place. Where no transaction occured, you could enter a value of 0 with the IF expression and accomplished the same suppression of output. You choose which way makes the most sense to you.) The only other new column listed is one called FULL SERV?. This column is used to identify which cars are to be counted as receiving full service. Since I know the price charged for full service, $19.95 or more, then I can use the typical IF expression to test for it:

IF(E21>=19.95,1,0)

(Of course we use another user-defined format to suppress all zero values and print the value 1 as an integer.) Thus, at the bottom of the template we count all those cars receiving full service with a simple SUM function–see cell F54. (Similarly, we can then compute all the other summary totals of charges (cell H52), and Payments and Credits (cell H53)). Since we now know the number of cars earning full-service credit, we can determine the amount of the customer's discount with the expression:

IF(E54>=6,.25*H52,IF(E54>=3,.15*H52,0))

Thus, those customers with six or more full serviced vehicles will earn a 25% discount on all charges; those customers with three, four or five full serviced vehicles will earn a discount of 15%, and those with less than three full serviced vehicles will earn no discount. Now, all we must do is compute the total outstanding bill amount. This is done with the expression:

H52-H53-H54+H55

or:

Total charges -Total Payments and Credits -Discount + Outstanding balance from previous month

At this point you may be wondering how we are going to use this template with our standard worksheet. It's really quite simple. All we need to do is to /Load this template directly into our current worksheet. Once both have been combined, we can follow the procedure outlined above about working with the data base management option and copying important information from one cell to another. Then, all we must do is to print our results. This is exactly what we shall do with the second SuperCalc macro. See Table 3d.

Now, examine the logic of the macro. First, we will insure that SuperCalc will be working with the correct data and will be correctly calculating in the appropriate order by setting the order of calculations to ROW and /Blanking out all cells which might have been used by previous macros. (See rows 1 and 2 of our macro.)

Then, since we shall use the invoice template, INVTMP, we shall first (1) /Arrange all transactions by DATE and (2) /Insert leading blank rows so that the format of our worksheet and template match. Now, we can /Load the template using the SuperCalc command in line 5 of the macro. Note that the template may have been stored in cells A1 through H60, but we indicate that we wish it to be placed beginning in cell I1.

Thus we shall not write over any work-

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CIRCLE **23** ON READER SERVICE CARD

TABLE 3b: INVOICE TEMPLATE

	B	C	D	E	F
1					
2					
3					
4					
5		U "Statement from: SPEADY OIL SERVICE			
6		U "123 MAIN STREET		U "(904) 555-1234	
7		U " Tallahassee, FL. 32301			
8					
9					
10				U "COMPANY NAME	
11				U "COMPANY ADDRESS	
12				U "COMPANY CITY, STATE, ZIP	
13					
14					
15	U "BILL BEGINS:				
16	U "BILL ENDS:				
17					
18					
19	U "DATE	U "CHARGE #	U "AMOUNT	U"CHARGES	U "FULL SERV?
20	U '=				
21				(3) U IF(OR(C21=("CREDIT"),C21=("PAYMENT")),0,D21)	(4) U IF(E21>=19.95,1,0)
22				(3) U IF(OR(C22=("CREDIT"),C22=("PAYMENT")),0,D22)	(4) U IF(E22>=19.95,1,0)
23				(3) U IF(OR(C23=("CREDIT"),C23=("PAYMENT")),0,D23)	(4) U IF(E23>=19.95,1,0)
24				(3) U IF(OR(C24=("CREDIT"),C24=("PAYMENT")),0,D24)	(4) U IF(E24>=19.95,1,0)
25				(3) U IF(OR(C25=("CREDIT"),C25=("PAYMENT")),0,D25)	(4) U IF(E25>=19.95,1,0)
26				(3) U IF(OR(C26=("CREDIT"),C26=("PAYMENT")),0,D26)	(4) U IF(E26>=19.95,1,0)
27				(3) U IF(OR(C27=("CREDIT"),C27=("PAYMENT")),0,D27)	(4) U IF(E27>=19.95,1,0)
28				(3) U IF(OR(C28=("CREDIT"),C28=("PAYMENT")),0,D28)	(4) U IF(E28>=19.95,1,0)
29				(3) U IF(OR(C29=("CREDIT"),C29=("PAYMENT")),0,D29)	(4) U IF(E29>=19.95,1,0)
30				(3) U IF(OR(C30=("CREDIT"),C30=("PAYMENT")),0,D30)	(4) U IF(E30>=19.95,1,0)
31				(3) U IF(OR(C31=("CREDIT"),C31=("PAYMENT")),0,D31)	(4) U IF(E31>=19.95,1,0)
32				(3) U IF(OR(C32=("CREDIT"),C32=("PAYMENT")),0,D32)	(4) U IF(E32>=19.95,1,0)
33				(3) U IF(OR(C33=("CREDIT"),C33=("PAYMENT")),0,D33)	(4) U IF(E33>=19.95,1,0)
34				(3) U IF(OR(C34=("CREDIT"),C34=("PAYMENT")),0,D34)	(4) U IF(E34>=19.95,1,0)
35				(3) U IF(OR(C35=("CREDIT"),C35=("PAYMENT")),0,D35)	(4) U IF(E35>=19.95,1,0)
36				(3) U IF(OR(C36=("CREDIT"),C36=("PAYMENT")),0,D36)	(4) U IF(E36>=19.95,1,0)
37				(3) U IF(OR(C37=("CREDIT"),C37=("PAYMENT")),0,D37)	(4) U IF(E37>=19.95,1,0)
38				(3) U IF(OR(C38=("CREDIT"),C38=("PAYMENT")),0,D38)	(4) U IF(E38>=19.95,1,0)
39				(3) U IF(OR(C39=("CREDIT"),C39=("PAYMENT")),0,D39)	(4) U IF(E39>=19.95,1,0)
40				(3) U IF(OR(C40=("CREDIT"),C40=("PAYMENT")),0,D40)	(4) U IF(E40>=19.95,1,0)
41				(3) U IF(OR(C41=("CREDIT"),C41=("PAYMENT")),0,D41)	(4) U IF(E41>=19.95,1,0)
42				(3) U IF(OR(C42=("CREDIT"),C42=("PAYMENT")),0,D42)	(4) U IF(E42>=19.95,1,0)
43				(3) U IF(OR(C43=("CREDIT"),C43=("PAYMENT")),0,D43)	(4) U IF(E43>=19.95,1,0)
44				(3) U IF(OR(C44=("CREDIT"),C44=("PAYMENT")),0,D44)	(4) U IF(E44>=19.95,1,0)
45				(3) U IF(OR(C45=("CREDIT"),C45=("PAYMENT")),0,D45)	(4) U IF(E45>=19.95,1,0)
46				(3) U IF(OR(C46=("CREDIT"),C46=("PAYMENT")),0,D46)	(4) U IF(E46>=19.95,1,0)
47				(3) U IF(OR(C47=("CREDIT"),C47=("PAYMENT")),0,D47)	(4) U IF(E47>=19.95,1,0)
48				(3) U IF(OR(C48=("CREDIT"),C48=("PAYMENT")),0,D48)	(4) U IF(E48>=19.95,1,0)
49				(3) U IF(OR(C49=("CREDIT"),C49=("PAYMENT")),0,D49)	(4) U IF(E49>=19.95,1,0)
50				(3) U IF(OR(C50=("CREDIT"),C50=("PAYMENT")),0,D50)	(4) U IF(E50>=19.95,1,0)
51					
52	U "TOTAL CHARGES FOR THIS MONTH				
53	U "TOTAL PAYMENTS AND CREDITS FOR THIS MONTH				
54	U "DISCOUNT (FULL SERVICE) |			U "FOR:	(I) U SUM(F21.F50)
55	U "BALANCE FORWARDED FROM PREVIOUS MONTH:				
56					
57	U "TOTAL PAYMENT NOW DUE				

sheet information and leave ourselves sufficient room to insert our II–Data management criterion block. Now, we can /Copy the worksheet information to our template area–client name and address, beginning and ending invoice dates, previous balance, etc.

Since we know that we shall use the II–Data management options, we can insert the criterion block in cells H19 and H21. Here the basic criterion is the DATE–all invoice transactions must be between the first and last day of the month. The expression that accomplishes this is:

AND(B21>=K15,B21<=K16)

B21 stores the first entry of the worksheet DATE transaction. The AND expression will make sure that this DATE conforms to the limits of the beginning DATE (K15) and the ending DATE (K16). Now, all we must do is eliminate the repeating label line with /DR20 (Delete Row 20), define the Input, Criterion, and Output blocks (see macro rows 15 through 20), and Extract the data from the Input to the Output region (see row 21).

Once the values are transferred, just recalculate all the values (!), /Insert the missing repeating label (======) row, /Format columns I,K,L, and print the results. Your worksheet will look like that of Table 3e; what will be printed is cell block I1 through P60, sans column labels or row numbers.

And now, all you need to do is to /Load each account worksheet each month and /eXecute this macro to produce the necessary invoice. That's not too tough...

Of course you may wish the macro to do more than this demonstration supports. For example, it would be a good idea to transfer the discount amount back to the worksheet area, delete the data base management information, and update the date. Go ahead and work on adding these and any other enhancements.

Conclusion

In this and the previous article, we have explored how to use one of the

TABLE 3b Continued

	G	H
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15	U "OLD BALANCE:	
16		
17		
18		
19	U "CREDITS	U "BALANCE
20		
21	(3) U IF(OR(C21=("CREDIT"),C21=("PAYMENT")),D21,0)	(3)U IF(B21=0,0,H15+E21-G21)
22	(3) U IF(OR(C22=("CREDIT"),C22=("PAYMENT")),D22,0)	(3)U IF(H21=0,0,H21+E22-G22)
23	(3) U IF(OR(C23=("CREDIT"),C23=("PAYMENT")),D23,0)	(3) U IF(H22=H21,0,H22+E23-G23)
24	(3) U IF(OR(C24=("CREDIT"),C24=("PAYMENT")),D24,0)	(3) U IF(H23=H22,0,H23+E24-G24)
25	(3) U IF(OR(C25=("CREDIT"),C25=("PAYMENT")),D25,0)	(3) U IF(H24=H23,0,H24+E25-G25)
26	(3) U IF(OR(C26=("CREDIT"),C26=("PAYMENT")),D26,0)	(3) U IF(H25=H24,0,H25+E26-G26)
27	(3) U IF(OR(C27=("CREDIT"),C27=("PAYMENT")),D27,0)	(3) U IF(H26=H25,0,H26+E27-G27)
28	(3) U IF(OR(C28=("CREDIT"),C28=("PAYMENT")),D28,0)	(3) U IF(H27=H26,0,H27+E28-G28)
29	(3) U IF(OR(C29=("CREDIT"),C29=("PAYMENT")),D29,0)	(3) U IF(H28=H27,0,H28+E29-G29)
30	(3) U IF(OR(C30=("CREDIT"),C30=("PAYMENT")),D30,0)	(3) U IF(H29=H28,0,H29+E30-G30)
31	(3) U IF(OR(C31=("CREDIT"),C31=("PAYMENT")),D31,0)	(3) U IF(H30=H29,0,H30+E31-G31)
32	(3) U IF(OR(C32=("CREDIT"),C32=("PAYMENT")),D32,0)	(3) U IF(H31=H30,0,H31+E32-G32)
33	(3) U IF(OR(C33=("CREDIT"),C33=("PAYMENT")),D33,0)	(3) U IF(H32=H31,0,H32+E33-G33)
34	(3) U IF(OR(C34=("CREDIT"),C34=("PAYMENT")),D34,0)	(3)U IF(H33=H32,0,H33+E34-G34)
35	(3) U IF(OR(C35=("CREDIT"),C35=("PAYMENT")),D35,0)	(3) U IF(H34=H33,0,H34+E35-G35)
36	(3) U IF(OR(C36=("CREDIT"),C36=("PAYMENT")),D36,0)	(3) U IF(H35=H34,0,H35+E36-G36)
37	(3) U IF(OR(C37=("CREDIT"),C37=("PAYMENT")),D37,0)	(3) U IF(H36=H35,0,H36+E37-G37)
38	(3) U IF(OR(C38=("CREDIT"),C38=("PAYMENT")),D38,0)	(3) U IF(H37=H36,0,H37+E38-G38)
39	(3) U IF(OR(C39=("CREDIT"),C39=("PAYMENT")),D39,0)	(3) U IF(H38=H37,0,H38+E39-G39)
40	(3) U IF(OR(C40=("CREDIT"),C40=("PAYMENT")),D40,0)	(3) U IF(H39=H38,0,H39+E40-G40)
41	(3) U IF(OR(C41=("CREDIT"),C41=("PAYMENT")),D41,0)	(3) U IF(H40=H39,0,H40+E41-G41)
42	(3) U IF(OR(C42=("CREDIT"),C42=("PAYMENT")),D42,0)	(3) U IF(H41=H40,0,H41+E42-G42)
43	(3) U IF(OR(C43=("CREDIT"),C43=("PAYMENT")),D43,0)	(3) U IF(H42=H41,0,H42+E43-G43)
44	(3) U IF(OR(C44=("CREDIT"),C44=("PAYMENT")),D44,0)	(3) U IF(H43=H42,0,H43+E44-G44)
45	(3) U IF(OR(C45=("CREDIT"),C45=("PAYMENT")),D45,0)	(3) U IF(H44=H43,0,H44+E45-G45)
46	(3) U IF(OR(C46=("CREDIT"),C46=("PAYMENT")),D46,0)	(3) U IF(H45=H44,0,H45+E46-G46)
47	(3) U IF(OR(C47=("CREDIT"),C47=("PAYMENT")),D47,0)	(3) U IF(H46=H45,0,H46+E47-G47)
48	(3) U IF(OR(C48=("CREDIT"),C48=("PAYMENT")),D48,0)	(3) U IF(H47=H46,0,H47+E48-G48)
49	(3) U IF(OR(C49=("CREDIT"),C49=("PAYMENT")),D49,0)	(3) U IF(H48=H47,0,H48+E49-G49)
50	(3) U IF(OR(C50=("CREDIT"),C50=("PAYMENT")),D50,0	(3) U IF(H49=H48,0,H49+E50-G50)
51		
52		(2) U SUM(E21.E50)
53		(2) U SUM(G21.G50)
54	U " VEHICLES:	(2)IF(F54>=6,.25*H52,IF(F54>=3,.15*H50)
55		(2) U H15
56		(2) U
57		(2) U H52-H53-H54+H55

TABLE 3c

NVOICE TEMPLATE FOR SUPERCALC3a MACRO

LEGEND: F Formula + Number
" Text ' Repeat b blank

	A	B	C	D	E	F	G	H	
1									
2									
3									
4									
5		"							
6				"					
7				"					
8									
9									
10					"				
11					"				
12					"				
13									
14									
15			"					"	
16			"						
17									
18									
19				"	"	"	"	"	"
20									
22						F	F	F	F
23						F	F	F	F
24						F	F	F	F
25						F	F	F	F
26						F	F	F	F
27						F	F	F	F
28						F	F	F	F
29						F	F	F	F
30						F	F	F	F
31						F	F	F	F
32						F	F	F	F
33						F	F	F	F
34						F	F	F	F
35						F	F	F	F
36						F	F	F	F
37						F	F	F	F
38						F	F	F	F
39						F	F	F	F
40						F	F	F	F
41						F	F	F	F
42						F	F	F	F
43						F	F	F	F
44						F	F	F	F
45						F	F	F	F
46						F	F	F	F
47						F	F	F	F
48						F	F	F	F
49						F	F	F	F
50						F	F	F	F
51									
52			"						F
53			"						F
54			"			F		"F	
55			"						F
56									
57			"						

TABLE 3d: SUPERCALC 3a MACRO FOR INVOICING

A		B			
1	/GR	Set ROWorder calculations.	19	//DOJ19.L49	DataBase OUTPUT block
2	/BG1.P250	Blank out all cell values from G1th rough P250	20	"	
3	/ACB,11.200,A,N	Arrange current worksheet by date.	21	//DE	Extract data from worksheet area to invoice area
4	/IR1.10	Insert ten blank rows.	22	"	
5	/LINVTMP,PA1.H60,I1	Load file INVTMP into current work-sheet@I1	23	!	Recalculate all values
6	/CA10.A14,M9	Copy client name and address to invoice form	24	/IR20	Insert ROW 20
7	/CB15,K15	Copy invoice beginning date to invoice form	25	=A20	Set marker in cell A20
8	/CB16,K16	Copy invoice ending date to invoice form	26	'=	Enter repeating label====
9	/CB17,P15	Copy previous balance to invoice.	27	/FCK,TC	Center transaction codes
10	=H19	Set marker in cellH19	28	/FCL,0	Set AMOUNT column width to zero
11	"DATE	Enter label DATE	29	/FCI,5	Set column\Ito awidth of 5 characters
12	=H21	Set marker in cellH21	30	=I1	Set marker in cell I1
13	AND(B21>=K15,B21<=K16)	Enter criterion test(DATE) values	31	/GB	Toggle Border to Off
14	/DR20	Delete ROW 20	32	/ODI1.P60,P	Send invoice to Printer
15	/DIA19.F250	DataBase INPUT block	33	/GB	Toggle Border to On
16	"				
17	//DCH19.H20	DataBase CRITERION block			
18	"				

most powerful features of new and old spreadsheet software, i.e., macros. Next time we shall explore further what to do if you wish to continue to use THE Spreadsheet and wish to be able to sort your spreadsheet data. We'll examine closely some useful utilities, too.

Correction to Part 1

There was an error in Part 1 of Working With Macros, page 42 and 43 of the December 1986 issue. The information listed under letter D in Table 2a and 2b should appear under letter E.

Please rate this article on the Reader Service Card by circling:

91 Excellent **92** Good
93 Fair **94** Poor

TABLE 3f

Statement from: Speady Oil Service
123 Main STR(904) 555-1234
Tallahasee, FL 32301

ABC ELECTRIC
2415 Springhill Road
Tallahassee, FL 32304

Bill Begins 9/1/86 Old Balance: $100.00
Bill End: 9/30/86

Date	Charge#	Charges	FullServ?	Credits	Balance
9/2/86	C023650	22.42	1		122.42
9/4/86	C024047	19.90			142.32
9/5/86	Payment			40.00	102.32
9/17/86	C024666	19.95	1		122.27
9/22/86	CO25885	19.95	1		142.22
					142.22

Total Charges for this month	$82.22
Total Payments and Credits for this month	$40.00
Discount (Full Service) For: 3Vehicles: $	$12.33
Balance Forwarded From Previous Month:	$100.00
Total Payment Now Due	$129.89

TABLE 3e: WORSHEET AREA AFTER MACRO HAS BEEN EXECUTED

Statement from: SPEADY OIL SERVICE
123 MAIN STR(904) 555-1234
Tallahassee, FL. 32301

ABC ELECTRIC
2415 Springhill Road
Tallahassee, FL32304

SPEEDY OIL SERVICE
1234 Main Street
Tallahassee, Fl.32312

ABC ELECTRIC
2415 Springhill Road
Tallahassee, FL32304

ZBEG. BILLING 9/ 1/1986
END BILLING: 9/30/1986
BALANCE: $100.00

BILL BEGINS: 9/ 1/1986
BILL ENDS: 9/30/1986

OLD BALANCE: $100.00

CHARGE #	DATE	MAKE/YEAR	LICENSE	MILEAGE	AMT	DATE	DATE	CHARGE	CHARGES	FULL SERV?	CREDITS	BALANCE
CO23650	9/ 2/1986	BUICK	2A12474	112,619	22.42	1	9/ 2/1986	CO23650	22.42	1		122.42
CO24047	9/ 4/1986	CHEVY-81	2C-29008	2,575	9.90		9/ 4/1986	CO24047	19.90			142.32
PAYMENT	9/ 5/1986			40.00		9/ 5/1986	PAYMENT				40.00	102.32
CO24666	9/17/1986	BUICK	2A12474	123,700	19.95		9/17/1986	CO24666	19.95	1		122.27
CO25885	9/22/1986	CHEVY	2C-29008	45,231	19.95		9/22/1986	CO25885	19.95	1		142.22
CO29888/	10/ 2/1986	BUICK	2A12474 1	35,125	20.44							142.22

TOTAL CHARGES FOR THIS MONTH	$82.22
TOTAL PAYMENTS AND CREDITS FOR THIS MONTH	$40.00
DISCOUNT (FULL SERVICE) FOR: 3 VEHICLES:	$12.33
BALANCE FORWARDED FROM PREVIOUS MONTH:	$100.00
TOTAL PAYMENT NOW DUE	$129.89

Please Pass the Graphics

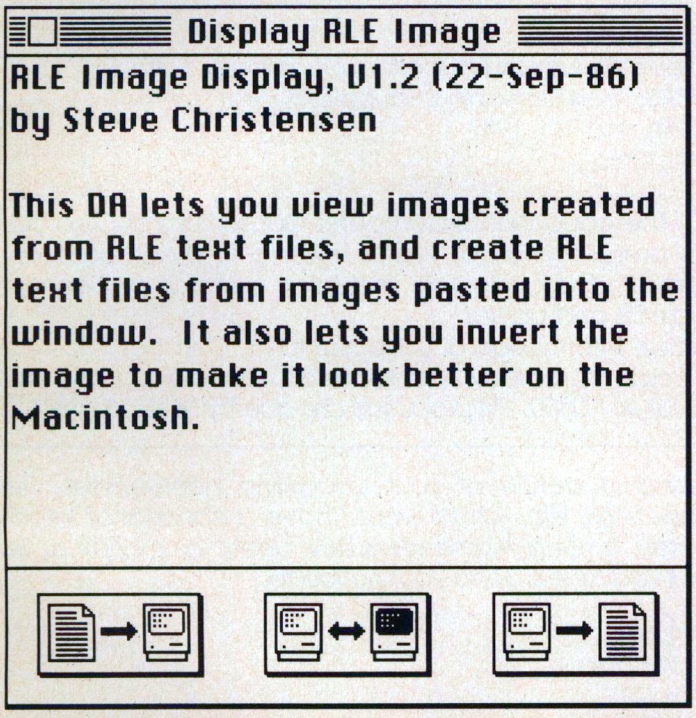
Ken Watters

There have been several articles written in *Call-A.P.P.L.E.* over the past years dealing with how to pass data back and forth between the Macintosh and Apple II computers. I can take credit for at least one of those (Macintips, April, 1985), and Jan Eugenides even provided some software to make the transfer easier in "An Apple-to-Mac Connection" (July, 1985). Of course, if the machines are in a remote location, a modem and terminal software is all that is needed. So, assuming that you have an Apple II series machine and a Mac, and have figured out how to get the two to talk to each other, here is an interesting thing they can "talk" about.

Have you ever wondered about directly passing graphics back and forth between the Mac and Apple II? It turns out it can be done, and very easily to. Figure 1 is the proof—remember the Apple logo on some of the "Diskware" software series from Apple? There it is, and this article was prepared on a Macintosh! Here's how.

FIGURE 1: The Apple II Logo on a Macintosh

FIGURE 2: The "Display RLE Image" Desk Accessory


Display RLE Image
RLE Image Display, V1.2 (22-Sep-86)
by Steve Christensen
This DA lets you view images created from RLE text files, and create RLE text files from images pasted into the window. It also lets you invert the image to make it look better on the Macintosh.

You will need three public-domain programs one for the Mac and two for the II. The Mac program is a desk accessory called "Display RLE Image" by Steve Christensen (Figure 2), and the Apple II programs are called "WRADAR" and "RADARW", written in AppleSoft BASIC, which work under either DOS 3.3 or ProDOS. There is a small machine language routine called "WRADAR.OBJ" that is included with WRADAR. All of these programs are available on MAUG through CompuServe™. As I recall, you will find the Apple II programs in "EXECable" format on Data Library 5 in the Apple II section, and the Mac Desk Accessory in Data Library 1 in the Macintosh section.

These programs were originally designed to "translate" RLE-format graphics from CompuServe™ for viewing on the Apple II or Macintosh screen. All of Compuserve's weather maps and FBI "10 Most Wanted" posters are in this "generic"format,and are downloaded as textfiles of what appear to be meaningless characters. If you pass an RLE file through "WRADAR" or "Display RLE Image", you will see the graphic appear on the Apple II or Mac. Obviously, we

should be able to pass the graphic between the two computers in RLE format. So far, so good, but how do we take a graphic created on the Mac or Apple II and display it on the other computer?

It turns out that these programs will also work in reverse. "Display RLE Image" will accept an image from the Mac's clipboard and translate it into an RLE textfile, and RADARW will take an Apple II hi-res image from memory or disk and also output an RLE textfile. Essentially, that is all there is to it. For example, to prepare an Apple II screen with MacPaint, make up your graphic as you normally would, except you will have to restrict yourself to about a 3" by 3" drawing size. The desk accessory will show you a window of the correct dimensions. When you are finished, copy the graphic and paste it into the desk acces-sory. Then click on the Image-to-File button. You will see the standard dialog box asking you to name the file. Next, transfer the file to your Apple II, using any of the methods mentioned above. Finally, run "WRADAR" and type the name you have given the file ðn the II. *Voila*! There is your handiwork (in Apple II style black-and-white, of course).

There are a couple of limitations to be aware of, size being the major one. RLE graphics are only 255 pixels wide, so they do not quite take up the entire width of the Apple II screen. As I mentioned before, you get about a 3" by 3" window on the Mac, but the graphic is identical on the two machines, pixel for pixel. Naturally, all color information is lost in translation. You will have to color your MacPaint masterpiece using Apple II software, and colors are shown as shades of gray on the Mac.

So there you have it. Next time you need that special game screen on your trusty Apple II, just turn on the Mac and "Pass the Graphics"!

Please rate this article on the Reader Service Card by circling:
110 Excellent **111** Good
112 Fair **113** Poor

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EVENTS CALENDAR

COMPUTER FAIR II

We have a dominant theme for our fair every year; this year's theme "People and Computers Now". We propose this year to have our fair show how computers are actually being used by people. In short, a retrospective look at what people are using their computers for. It will be held March 21, 1987 at UW-Parkside in the Molinaro concourse from 10:00 am to 4:00 pm. Admission will be $2.00 for adults and children under 12, accompanied by parent, free.

University Wisconsin-Parkside's Computer Fair II (People and Computers now) March 21, 1987, UW-Parkside, Wood Rd- Box 2000, Kenosha, WI 53140.

CALL FOR PAPERS

ECCO'S Seventh Annual Educational Computer Fair
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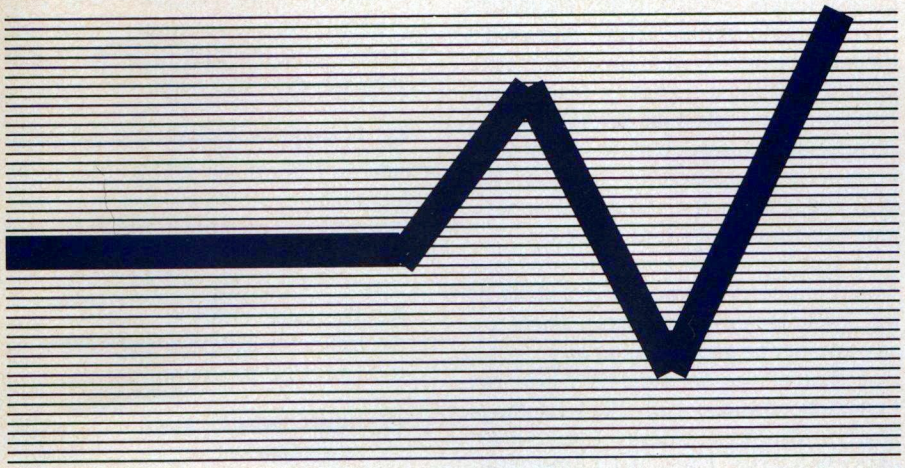
For further information or proposal form, Contact Alice Fredman, at *Ecco, 1123 S.O.M. Center Road, Cleveland, Ohio, 44124 or Call (216) 461-0800. All proposals are due by May 15, 1987.*

Please send in details of your upcoming conferences, trade shows, meetings, etc. which would have a national or international interest among Apple users. We need your copy at least 2 months in advance. Send your notice to:

Call -A.P.P.L.E.
Events Calendar
290 SW 43rd St.
Renton, WA 98055

A.P.P.L.E. Doctor



Bruce Field / Robert Platt

A FELLOW CONSPIRATOR

I would like to welcome a conspirator to this column. Starting with this column, Robert Platt will help me answer questions. Bob's area of expertise is Pascal, so bring on those Pascal questions. I certainly appreciate Bob's help and I think you will too.

Several people have had occasional problems with I/O errors in ProDOS ver. 1.1.1. Upon further inspection they have found track 0 destroyed. Several months ago I received letters from readers who found that replacing the power supply usually solves the problem. Why this worked was not known. More recently Stephen Thomas of MacLagan Wright & Associates in West Heidelberg, Australia identified the source of the problem and published a patch program in Tom Weishaar's *Open Apple* that fixes the problem. However, I recently discussed this problem with our local Apple II hardware expert, Tom Vier, and he pointed out that most people are not aware that there are three versions of ProDOS 1.1.1. One is dated 5-May-85 (or so), one 25-Aug-84, and one 18-Sep-84. All these versions are listed as 1.1.1, so you have to check the date to be sure which one you have. Tom reports that he has never had a problem with the September 84 version, and believes that no patch is necessary.

A SIMPLE TEST

Last month I had a question about an intermittent hardware problem that causes the "G" command in the monitor to fail after the computer had been left on for several hours. The reader compared the ROM code to a version downloaded earlier (when everything was working fine) and the two copies agreed perfectly. I suggested that the problem might be an intermittently bad RAM chip. Bob Anderson called and said he had a similar problem and in his case it was a ROM chip that went bad when it was continually accessed. He felt that continuously reading a certain address on the chip caused it to heat up and produce errors. Whatever the reason, he found the problem by downloading a copy of the ROM into RAM and then setting the Monitor to continuously compare the ROM and RAM versions until errors were eventually found. (For the non-techie types who were just turned off by all this ROM, RAM, and Monitor gibberish, patience please. Just type in the following stuff to see if you have a problem with your computer.)

To do this test start with the Apple-Soft BASIC prompt (]) and type:

```
CALL -151                (to get into the Monitor)
800<F800.FFFFM           (to copy the Monitor ROM to RAM)
N800<F800.FFFFV34:0      to continuously compare)
```

If all the memory locations in the two copies agree, nothing will be printed on the screen. If you have a problem and the memory locations disagree the addresses and contents will be printed. You will have to press ctrl-RESET to stop the test.

That last line in the program was a new one to me. Bob insisted it was described in the *Apple II Reference Manual* (which I thought I knew inside and out). Sure enough on page 56 of the *Apple II Reference Manual*, or page 106 of the *Apple //e Reference Manual*, the technique of repeating Monitor commands is described.

APPLE-IBM CONVERSIONS

Q. *Recently I have become heavily involved with IBM PC MS-DOS applications. Is there some way I can run or convert Apple programs to run on the PC?*

A. There are two problems to be solved here. First you need a way to move the program or data from Apple formatted disks to MS-DOS format. Matchpoint-PC, $195 from *Micro Solutions, Inc.*, 125 South Fourth St., DeKalb, IL 60115, (815) 756-3411 is a card and software for the PC that lets PC users read and write Apple DOS, ProDOS, SOS, and CP/M disks. *This product is available through A.P.P.L.E. Co-op for $179.00 (Product code: HIMAMP).* (*ASKY, Inc.* 4320 Stevens Creek Blvd., Suite 287, San Jose, CA 95129, (408) 247-5742, sells a similar product, "Envoy" for $180.)

These products will let you transfer data between machines fairly easily, but usually programs written for one machine will not work on the other. Some AppleSoft programs that do not use PEEKs or POKEs may need only minor conversion to run under IBM's BASICA. Most commercial programs and any programs written in machine language for one computer will not work on the other machine. At one time there existed co-processor boards, i.e. boards with another microprocessor chip so programs designed for one machine could run on another. Except for some CP/M boards for the Apple co-processor boards seem to have disappeared from the market.

REPLACE THE CONTROLLER CARD

Q. *I recently purchased a copy of AppleWorks 1.3 and also received MacroWorks a few days later. Neither program will boot on my machine. I have an enhanced //e, Teac FD-55A disk drives, and a "generic" disk controller card. I had my drives checked for align-*

ment and speed at a computer repair shop and they tested to specs. I hate to invest in new drives if I don't have to, but will if you think that's the source of my trouble.

A. One of us had a similar problem awhile ago. The problem turned out to be the ROMs on the disk controller card. The dealer where we bought the card was able to upgrade to new ROMs and everything worked after that. If you can, get hold of an Apple disk controller card and try that. Then see your dealer about upgrading or replacing your controller card.

NICE HEADLINES

Q. *I act as consultant to the adviser and staff of a high school newspaper. We currently use a photographic method of printing headlines, and would like to find some way to update our headline printing without sacrificing image quality. We have access to many different computers in the school, including Apple //e's and Mac's, and dot matrix printers, but no laser printer. None of the software we have available does a satisfactory job of printing headlines. Is there any software package available that will allow us to print near type set quality headlines using hi-res fonts in sizes up to at least 36 point?*

A. A laser printer is exactly what you need of course, but you can also make good quality headlines with a dot matrix printer. There are several programs available for the Apple //e. The Print Shop by *Broderbund Software*, Fontrix by *Data Transform*, and Apple Mechanic by *Beagle Bros* are some examples. Fontrix (Data Transform, 616 Washington Street, Denver, CO, 80203, (303) 832-1501) produces the highest quality letters. Fontrix prints characters over multiple hi-res screens and prints the screens side-by-side on a dot matrix printer. My local authority claims that Fontrix is very slow in scrolling hi-res screens unless used with a RAM disk. Fontrix is advertised by most of the mail order firms for about $89 or less, plus $19 for each 14-font font pack.

If you have easy access to a Mac, I would recommend you use it instead of the Apple II (sorry II people). There are any number of good fonts in large sizes. One that comes to mind is Click Art Letters by *T/Maker Co.*, 1973 Landings Drive, Mountain View, CA 94043, (415) 962-0195. Click Art Letters contains 24 high quality typefaces in large point sizes (24, 36, 48 and 72 point). Almost any Mac program, MacDraw for example will produce good headlines. *Broderbund* also a version of The Print Shop for the Mac and this can be easily used to create personalized cards, banners, letterheads, or signs. If you use MacWrite, install a font in your system that is the same typeface, but twice the size of the font you are using. When you pick "BEST" quality in the printer dialog box, MacWrite will scale down the double size font to give you twice the normal resolution.

AUTOMATIC PROGRAM EXECUTION

Q. *How do I configure a DOS 3.3 disk so that it will execute a particular AppleSoft program automatically when I turn on my Apple II?*

A. Three different methods are available. (1) Load the AppleSoft program into memory, and then INITialize a disk with the command: INIT HELLO,V100. This will save the program on the disk with the name HELLO, and will mark the disk with the fact that the named program should be automatically run. There is nothing magic about the name "HELLO", any name will work. (2) If the disk was initialized with HELLO or another particular program name as the first program to be run, just save your program under that same name. This will delete the other program that had the name. (3) A disk editor (or zap) program can also be used to change the name of the program that is designated to run first.

WITH PRODOS

Q. *Ok, how about a ProDOS disk?*

A. Make sure that your disk has a copy of the files PRODOS and BASIC.SYSTEM. Save your AppleSoft program onto the disk with the name STARTUP. No other name will work.

Q. *Instead of running an AppleSoft program, I want an EXEC file to be automatically executed when the Apple II is turned on. How can I fix my ProDOS disk for this?*

A. The same principle applies. Type in the following program and save it as your STARTUP program:

```
10 PRINT CHR$(4);"EXEC
   FILENAME"
20 END
```

This will send the ProDOS command EXEC FILENAME to trigger your sequence of events (which may involve running one or more other programs.)

AND...APPLE PASCAL?

Q. *How about Apple Pascal disks?*

A. The disk must have a copy of SYSTEM.APPLE and SYSTEM.PASCAL. Then copy the compiled .CODE file onto the disk under the name SYSTEM.STARTUP.

A TIME SAVER

Q. *How can I automatically invoke a p-System EXEC file upon starting up?*

A. Save a compiled version of the following program as SYSTEM.STARTUP:

```
Program Starter;
Uses Chainstuff;
begin
  Chain('EXEC/FILENAM.TEXT')
end.
```

The Chain procedure will be the equivalent of typing EXEC/FILENAM.TEXT at the prompt of the Xecute command from the main menu.

Please rate this article on the Reader Service Card by circling:

75 Excellent **76** Good
77 Fair **78** Poor

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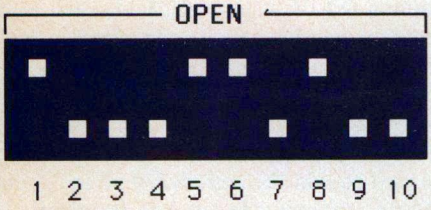
Write— A.P.P.L.E.

Reader's Forum

Telecommunications Update

Modem Magician works fine with the Cermetek Applemate 1200 modem! Simply set the dip switches as shown below. Then configure Modem Magician (select hardware system) for super serial card and Apple\Hayes compatible modem.



Making a CALL

I see from the latest *Call-A.P.P.L.E.* issue that you're the "Hot-Line" consultant.

Enclosed is a BASIC program where I'm attempting to CALL an assembler sort in statement 200. It gives me a "Syntax error". I also enclosed a page from a magazine article which seems to do the CALL in the same way.

Could you inform me of the correct way to make a CALL and to pass parameters following it? Thanks for the Help.

Bruce Norgan

```
 10  HIMEM: 37888
 20  PRINT CHR$ (4) "BLOAD
     SEARCH(9400), A $9400"
 30  PRINT CHR$ (4) "BLOAD
     SORT(94A0), A$94A0"
 40  SEARCH=37888; SRT=38048
 50  DIM XREF$ (300)
100  FOR I = 0 TO 11
110  READ XREF$(I); NEXT
115  NR=I + 1; GOTO 200
120  DATA"NORGAWIB 01"
125  DATA"NORGAJAM0 2"
130  DATA"HANSOTEA003"
135  DATA"HANSOLLB00 "
140  DATA"LLLLLFFM005
145  DATA"LAST FIM006"
150  DATA"NORGASAJ 007"
155  DATA"NORGAKER008"
160  DATA"ZZZZZXXY009
165  DATA"FFFF DDE010"
170  DATASMITHEAA011"
175  DATA "CCC AAB012
200  CALLSRT,XREF$NR, 0,7
300  FOR I = 0 TO NR - 1
310  PRINT XREF$(I) ; NEXT
320  END
```

Thank you for sending me your question. It does help to have a hard copy to communicate a problem. Because of your example I was able to find an answer.

AppleSoft's CALL statement can be extended past the regular syntax, as in your example: CALL SRT, NA$,-L,H,M,N,X. This is really an illegal syntax, as your attempts have discovered, but because of the nature of the CALL statement the syntax error can avoided. This is how.

AppleSoft will interpret the CALL statement up to the point of a proper syntactic statement, such as CALL -151. Then it immediately CALLs the indicated subroutine. After the subroutine has been CALLed, it will interpret the rest of the statement and report a syntax error if there are additional characters on the line. In order to pass arguments into your subroutine, your subroutine must parse the rest of the line and get it out of the AppleSoft interpreter's way.

Parsing a statement for AppleSoft requires some knowledge about how AppleSoft works. The best references I can suggest are:

- All About AppleSoft, *by our Co-op,*
- What's Where in the Apple, *by William F. Luebbert,*

I hope I have explained myself well enough for you. If you have any further questions, please contact me again, by mail or phone The Hotline is (206) 251-0071, and is open from 9:00am to 3:00-pm weekdays I wish you all the best.

Keith Nemitz
Test and Evaluation

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Beneath Apple ProDOS
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By Don Worth and Pieter Lechner

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NOTICE** to owners of **Bag of Tricks 2

Version 2.1, a substantial upgrade to Bag of Tricks 2, is scheduled for release on March 1, 1987. Registered owners may call and order the upgrade for $15 plus shipping and handling.

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***Universal File Conversion** by Gary Charpentier*
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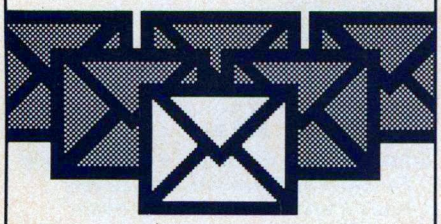


Call -A.P.P.L.E. welcomes letters from its readers on any topic relating to the magazine's content, experiences with hardware and software, A.P.P.L.E. services, current issues in computing, or programming notes. Because of space limitations, not all letters can be selected for publication or printed in their entirety, but we try to present a representative sample of your views. If you would like your address published, please include it next to your signature.

Send to:

Write -A.P.P.L.E.
290 SW 43rd St.
Renton, WA 98055

An AppleWorks Bug?

I am writing in reference to a bug in AppleWorks V2.0. I should mention I'm using an enhanced IIe and ImageWriter II. About a month ago, I purchased the new version of AppleWorks and anxiously brought it home and jumped right in. I maintain several sizeable spreadsheets and when printing, I set my ImageWriter II to slash zeros. (ESC D CTRL @ CTRL A) I found that V2.0 will simply not accept the <CTRL @> sequence. I have tried in the "SC" section of the spreadsheet, data base and word processor printer controls, in addition to the printer control section of the main menu, without success. The program has no problem sending the <CTRL @> if it has been previously defined in the printer options. I have managed to circumvent the bug by taking advantage of that fact and maintaining an empty file created by an earlier version which contains the proper control character sequence and printing the blank file to set the printer.

It's interesting to note that the response from the local dealer from which I made the purchase was that he would be glad to instruct me on the proper use of the software. It may also be interesting to note I haven't spoken to them since!

I've read with anticipation the reviews and every mention of V2.0 in your magazine and have found no reference to the bug. I wonder if anyone else has come across it yet. Does Apple know? If so, are they willing to correct the problem? Maybe you can bring it to their attention.

By the way, A.P.P.L.E.Co-op is terrific. Keep up the good work.

Mark W. Geisinger

In answer to a recent letter regarding an apparent bug in AppleWorks 2.0, I have to say that you might be mistaken. At least to the point that you need to print a dummy file to set up the printer. I too use an enhanced IIe here at work with an ImageWriter II and found that if I used the SC control from within the spreadsheet and then entered the CONTROL D CONTROL-@, CONTROL-A, the CONTROL-@ didn't show up on the screen as you would expect, but it did print slashed zeros. I did find that the slashed zeros off command seemed to mess up linefeeds. However, I also found that by entering a RETURN at the end of the CONTROL-Z-@ CONTROL-A sequence, it cleared the linefeed problem up.

Larry Neibauer
A.P.P.L.E Product Developement and tech Support

Missing Line

A line was missing in the *Penultimate Quit Call* listing published in the December issue. The line should read:

1445: 17 8D 20 12 8D 18 12 A9

No Limits

I enjoyed the article by Edd Marquart on "Breaking the Ramdisk Barrier" which you carried in your November 1986 issue. I'd like to expand on some information stated in the article concerning DATA statements. Edd stated that you couldn't include some lines which contained colons or quote marks in DATA statements. He referred to the following line: DATA TEXT: HOME: PRINT" Loading RAMDISK," which he said couldn't be included at all in DATA statements because of its use of colons or quotes. This is not entirely true. Most lines can be typed into DATA statements totally without the use of quotes. However, if the line contains colons or commas, it becomes necessary to enclose the entire line in quotes.This is because these two symbols are delimiters for the DATA statement command. But, if that line also contains quotes, as in a PRINT statement, then it is necessary to place the colon part and quote part in separate DATA statements. For the example noted above, DATA "TEXT:HOME" followed by DATA PRINT "Loading RAMDISK.", will function just fine. The colon is enclosed in quotes, so no problems result, and the quote marks appear in a separate DATA statement. There really are no limits to creating the necessary DATA statements to help set up the RAMdisk files.

Craig Peterson

Please rate this article on the Readers Service card by circling

79 Excellent **80** Good
81 Fair **82** Poor

The MARKETPLACE

The following items are selected by our editorial staff from the large number of product announcements and news releases sent to us daily. They are presented solely to keep you informed about the current market for Apple related hardware and software. As we have not tested many of these products, appearance here does not necessarily represent endorsement or recommendation by **A.P.P.L.E. Co-op.** Further information about items appearing in **The Marketplace** can be obtained through the Reader Service Card. If you contact any manufacturer directly, please mention that you learned about them in **Call -A.P.P.L.E.**

WORDPERFECT

WordPerfect Corporation announces an updated release of their popular word processor for the Apple IIe and IIc: WordPerfect 1.1. High on the list of enhancements is the increased overall speed (text entry and display) of the program, %100 faster than version 1.0.

The new version includes an install program that takes advantage of expanded memory and other ProDOS compatible hardware. This feature is especially tempting to dedicated Apple users who want to make the most of their computer's capabilities.

The documentation explains not only how to execute a given function, but also why to do it in that particular way. Furthermore, the manual describes what your screen should look like at every step along the way, making it easier for the first time user to learn a new function."

The 50,000 word speller, now included with 1.1, checks a single word, page, document, then helps you locate the correct spelling by displaying lists of possible spellings to choose from. You may also add your own words to the dictionary. Another plus for the1.1 version, support for true proportional printing for both HMI and microspacing printers. Price: $179.00,

WordPerfect Corporation, 266 West Center, Orem, UT,84057, (801) 227-4020.

CIRCLE **90** ON READER SERVICE CARD

UPGRADED BANK STREET

Bank Street Writer, Broderbund's award-winning word processor has now been upgraded to offer a variety of new features for the 128K. Apple IIe, IIc IIGs. The new program, Bank Street Writer Plus, includes a spelling corrector with a 60,000-word dictionary, an on-line thesaurus, a high-speed editor, and pull down menus. It also allows more experienced users to create"short-cut" single-key commands to skip over traditional functions and prompts. The suggested retail price for Bank Street Writer Plus is $79.95. (In addition, Bank Street Writer for the 64K Apple II computer is still available, priced at $69.95.)

Broderbund SoftWare, Inc., 17 Paul Drive, San Rafael, CA, 94903-2101, (415) 479-1700.

CIRCLE **91** ON READERSEVICECARD

IMPROVED APPLE II COMPILER

An improved version of the PROMOL programming system for Apple IIe and IIc computers has been released by Systems Management Associates, Inc. Version 2.1 supports RAM-disk, I-O redirection, and multiple programs in memory at once, using a ProDOS-based "Executive" which lets Apple Programmers use simple MS-DOS like commands for executing programs, copying files, and other housekeeping chores.

The source code is available for PROMAL Executive, full screen Editor, Runtime Library, and optional Graphics Toolbox. Users can backup the program and see the inner workings of the systems and even customize it to their needs.

PROMAL is similar in philosophy and power to C, but is easier to learn, because a simplified syntax with indentation is used in place of confusing punctuation to show program structure. Price: $49.95

Systems Management Associates, 3325 Executive Drive, or PO Box 20025, Raleigh, North Carolina, 27619, (919) 878-3600

CIRCLE **92** ON READER SERVICE CARD

VERSATILLE COMPUTER DESKS

The newest additions to Bush Industries' growing collection of personal computer furniture are two highly functional, one piece desks with vertical storage. Suited for either home or office use, these new units offer other advantages of a large desk surface and a multi-use hutch in one compact design. Fully finished backs and modesty panels allow these work stations to be placed anywhere in the room. Their acrylic-coated work surfaces protect against marring.

In addition, the units have been designed for maximum flexibility in the placement of the computer keyboard, modem and accessories. And, easy-to adjust leveling glides counteract any unevenness in the floor. Model CT150 offers two open desk shelves as well as two adjustable storage shelves in the hutch for peripherals and accessories. The hutch also has an adjustable monitor shelf and a full-width bookshelf. The overall dimensions of this unit are 54-1/8 inches high by 39 inches wide by 23 inches deep. Model CT150 retail price of $149.95

Model CT152 features a similar design except that it's wider, deeper and some of its storage space is enclosed. There's a box drawer on the right-hand side of the desk and a door on the hutch's storage shelves for those who want a neat appearance. Rounding out the features on this handsome unit is an adjustable monitor shelf. Model CT152 measures 55 1/2" high by 47" wide by 26" deep. Price: $189.95,

Bush Industries, 1 Mason Drive, PO Box 460, Jamestown, New York, 14702-0460, (800) 248-BUSH or (800) 2 28-BUSH.

CIRCLE **93** ON READER SERVICE CARD

TAX AIDES

Federal Tax Forms

We are pleased to announce the 1986 edition of our FEDERAL TAX FORMS for AppleWorks users. Each tax form, schedule, and calculator is carefully prepared, tested for accuracy, and double-checked by an independent tax preparer.

The 1986 FEDERAL TAX FORMS ARE AppleWorks spreadsheet templates that automatically and accurately calculate& repro-

duce 12 commonly used tax forms:

Form 1040	U.S. Individual Income Tax Return 1986 (long)
Form 1040A	U.S. Individual Income Tax Return 1986(short)
Form 2106	Employee Business Expenses
Form 4562	Depreciation and Amortization
Schedule A	itemized Deductions
Schedule B	interest and Dividend Income
Schedule C	Profit or (Loss) From Business or Profession
Schedule D	Capital Gains & Losses & Reconciliation of Forms 1099-B
Schedule E	Supplemental Income Schedule
Schedule F	Farm Income and Expenses
Schedule SE	Computation of Social Security Self-Employment Tax
Schedule W	Deduction for a Married Couple when both work

Also incuded on the diskette are general instructions and files that calculate depreciation, amortization, and taxes. The 12 forms listed above and others you request are shiopped on an AppleWorks data diskette. Each form or schedule is a separate desktop file containing three sections:

- A short set of instructions.
- A transfer area, and
- The actual form.

The transfer area is used to enter any information required on more than one form or schedule. Once entered, the information is automatically placed in the appropriate location on the form. In addition, any information requiring transfer to other forms is easily accessible in this section.

Each form and schedule is a duplicate of the Tax Forms provided by the IRS. Information is entered in clearly marked cells on the form. All other cells are "protected" against incorrect entry callculations are automatic and any information needed by other forms is placed in the transfer area. When printed, the forms are error free and duplicate those used by the IRS. The printed forms can be used substitutes for IRS tax forms or the information can be transferred to IRS forms. The IRS color codes some of its forms, therefore not all computer printed forms are acceptable as substitutes.

To use our 1986 FEDERAL TAX FORMS, you need an Apple IIe, IIc with 128K (or more memory), or an Apple IIcs, AppleWorks, and a printer (optional) that is able to print 17 characters per inch. The tax forms are only $39.95 plus $2.50 for shipping and handling. Additional forms are available upon request at $5.00 per form (include $2.50 for shipping if ordered separately).

SKY Computer Resources, PO Box 204, Dept. G, Portland, OR 97207

CIRCLE **94** ON READER SERVICE CARD

New Tax Reform Analyzer

Intuit today announces help for all who are confused and concerned by the new tax law: The Tax Reform Analyzer software program. The Tax Reform Analyzer shows individuals how the recently signed Tax Reform Act affects them personally and what they should do to save money and avoid penalties.

The program is a set of 5 worksheet templates for the leading spreadsheet programs: Lotus 1-2-3, Symphony, SuperCalc, Multiplan, and AppleWorks. The Tax Reform Analyzer gives the four answers taxpayers need now:

- Does the new tax law help or hurt me? By how much?
- What will my tax bills be in 1986, 1987, and 1988?
- What should I do to cut my taxes under the new law?

The Tax Reform Analyzer answers these with concrete dollar estimates and specific action recommendations. It also graphs the taxpayer's tax situation. And it makes it easy to do otherwise complex "what-if's" such as "If I sold my stock this year instead of next, what happens to my tax bills in both years?"

To use it, the taxpayer types the key numbers from their last tax return into the Analyzer. This is made easy because the program's screens correspond exactly to the 1985 tax forms. The Analyzer then shows sample tax returns for 1986, 1987, 1988, and does all tax calculations. The Analyzer also provide special worksheets that cover tax-free vs. taxable investments, when to take long-term capital gains, and completing all calculations for the new complex W-4 form. Price: $29.00,

Intuit, 540 University Avenue , Palo Alto, CA 94301, (415) 322-0573.

CIRCLE **95** ON READER SERVICECARD

DESIGN YOUR OWN HOME SERIES

ABRACADATA, Ltd. announces taking over the distribution of DESIGN YOUR OWN HOME SERIES, (formerly published by Avant-Garde). Abracadata emphasized that they have made some significant improvements in the Apple II products including the incorporation of the Beagle Brothers graphic printer routines which supports 47 printers and 64 interface cards. Although Abracadata does not have any responsiblility for the previous version already shipped by Avant-Garde, it has established a disk-exchange policy for those who have older Apple versions of the program. The company should be contacted directly for details and exchange authorizations at *(503) 342-3030.*

Architectural Design

Offers 126 individual shapes that you can rotate and arrange any way you like. It includes standard architectural scales and automatically calculates distances, diagonals and angles. It lets you construct floor plans, top-view and side-view plans. You can change your plans as often as you like and add keynotes and labels for quick reference. It also lets you create any custom shapes you might need.

Interior Design

Automatically keeps your plans and showcase of furnishing true-to scale. You can explore color schemes for rooms and furniture and use multi-colored patterns for wallpaper or fabric designs. Move your furniture around the easy way to see where it fits best and then view it from top or side (hundreds of pieces are provided). Create your own custom furniture, too!

Landscape Design

You draw an outline of your home and property lines, and then plant flowers, trees and shrubs where you want them. Each plant is identified and you can label them for easy recognition. To help future planning, you can "age" your plants and trees to preview how they'll look as they grow. The program provides aerial views and side perspectives from north, south, east and west. A "paintbrush" graphics utility lets you add the finishing touches to your landscape. The Apple II programs require 48K, one or two disk drives and one of the following peripherals: mouse, joystick, paddles or graphics pad. A printer is optional; however, the programs are configured for 47 printers and 64 interface cards. Price: $69.95,

Abracadata, PO BOX 2352, Eugene, OR 97402,503)342-3030

CIRCLE **96** ON READER SERVICE CARD

MANAGE YOUR MONEY

Broderbund Software announces On Balance, a fast, easy to use money management program. Created or changed as needed, eliminating the hours of preparation time required for other home finance programs. Users can record and reconcile bank and credit card transactions, create and track budgets, print out reports and even print out checks. On Balance automatically records recurring transactions and reminds users when those payments are due. The program can add tax items and other special transactions, can give users instant and complete reports, and is compatible with AppleWorks, giving complete spreadsheet capability. Price: $99.95.

Broderbund Software, Inc., 17 Paul Drive, San Rafael, CA, 94903-2101,(415)479-1700.

CIRCLE **97** ON READER SERVICE CARD

AWARD WINNING LORDS OF CONQUEST

Electronic Arts announces its award winning conquer-the-world strategy game, Lords Of Conquest. Lords of Conquest could be compared to the famous board game RISK. Anyone who as enjoyed RISK will love Lords of Conquest. A classic strategy game in which the action takes place on a world map, Lords of Conquest is superior to RISK because it takes advantage of the computer's power to add greater game depth and variety.

In Lords of Conquest, a single player may play against the computer or up to three other players. Each opponent chooses home territories, then tries to protect his holding while conquering territories belonging to the opponents. Strategically important resources such as gold, herds of horses, iron, timber, and coal are distributed randomly throughout the onscreen map's territories. These resources may be used in exchange for important forces such as foot soldiers, cavalry, fleets and cities, thus making resource-bearing territories prime targets.

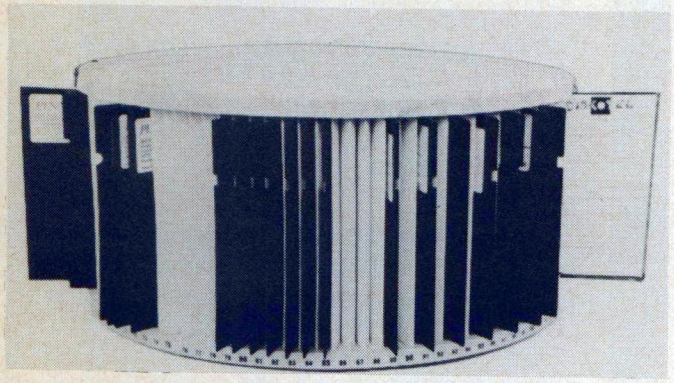
Lord of Conquest takes place in yearly cycles, each containing four or five phases. During each phase, players make crucial decisions that eventually lead to defeat, or victory. For example, the Development phase involves investment in cities and new weaponry. In Production, resource-bearing territories generate additional wealth.

At the game's onset, players determine the amount of resources, the kinds of forces to be used, the availability of transport, and the level of chance. Depending on the level of complexity Lords of Conquest may be played in a time space of as little as 20 minutes, or can occupy several hours. Price:$39.95

Electronic Arts, 1820 Gateway Drive, San Mateo, CA, 94404, (415) 571-7171.

CIRCLE **98** ON READER SERVICE CARD

NEW DISK STORAGE



PAC announces DISK-O-TEL, a carousel Model storage unit for audio disc, computer disc, etc. All Disc diameters up to an including 51/4".

It features:

- Your disks in paper protective envelopes, are stored in 108 separately numbered private rooms.
- Disk-O-Tel units are stackable, for tremendous storage capability.
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- No more fumbling through a clumsy box file.
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- Any disks missing? You can tell instantly with one rotation. Price: $49.00.

PAC, 2507 Ridgemoor CT., Dept K8, Arlington, TX, 76016

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- Courses are duplicated to actual scale with hills and valleys
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"I am not aware of any other golf game that even comes close to the graphics and realism of play...I highly recommend this game to anyone."
Mike Carlton
Apple-Dayton
Sept., '86

1STEP SOFTWARE, INC.

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1-704-525-6688 (in NC)
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Charlotte, NC 28210

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Anaheim, CA 92806
(714) 993-0294

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CIRCLE **16** ON READER SERVICE CARD

IIGS Section

UCSD PASCAL

Pecan Software Systems, the UCSD Pascal Company, announces, that it has implemented its Power System family of software development tools for the new Apple IIGS computer. UCSD Pascal, Modula 2, FORTRAN 77, BASIC and Assembler, as well as our program development aids, now function on the Apple IIGS.

Pecan's implementation of UCSD Pascal is the only one that is source, compatible with Apple Pascal, and provides an environment familiar to Apple Pascal programmers. Furthermore, extensions beyond Apple Pascal are offered in the areas of multitasking, dynamic memory management, extended precision arithmetic and separate compilation, among other areas. Pecan's UCSD Pascal was implemented especially for the 65816 processor, used by the Apple IIGS. It is ProDOS compatible and utilizes the new features of the Apple IIGS, including extended memory, sound and graphics.

The Power System Professional Pak, including the Power System development environment, compiler of choice and six popular program development aids, is available for $199.95. A specially packaged and priced version of the Power System with UCSD Pascal is available for the educational and recreational programming markets.

Pecan Software Systems, Inc.,1410 39th Street, Brooklyn, NY, 11218, (718) 851-3100

CIRCLE **100** ON READER SERVICE CARD

KYAN PASCAL

Kyan Software Inc. has introduced a version of its ProDOS-based Pascal for the Apple IIGS. The GS version is a fully validated implementation of ISO Pascal. It is designed for professional programmers who want to write programs which take full advantage of the power and features of the IIGS.

Kyan Pascal/GS includes a full-screen text editor, native code (65816) compiler, macro-assembler, and many programming utilities. It also includes extensions to standard Pascal (include files, object module chaining, string handling, graphjics) and full access to the Apple"s ROM-based tools. Also, the built-in macro assembler allows programmers to add in-line assembly source code to their Pascal programs.

Kyan Pascal/GS also includes KIX, Kyan's hard disk manager and UNIX like environment for ProDOS-16. KIX features more than 25 commands and utilities (including batch files) which make the IIGS easier to use with a UniDisk 3.5 or hard disk. Kyan Pascal/GS requires 512K of memory and is not copy protected. Price: $99.95.

Kyan, Software, Inc., 1850 Union Street, #183, San Francisco, CA 94123.

CIRCLE **101** ON READER SERVICE CARD

TV ON THE IIGS

A-squared systems announces A-LIVE!. It's TV on the Apple IIGS, but better. You can stop it, start it, color it, save it. It's a plug in card and interactive software for the IIGS. A-LIVE! accepts any NTSC ("video out") signal from video cameras, video cassette recorder, laser disks, and broadcast TV. A-LIVE! displays–and saves– the moving image on the IIGS's screen at 20 frames per second...real-time! The moving image shows off sixteen true shades of grey, creating a realistic picture unlike the simple black and white Macintosh image. The most startling difference is that the image moves. The moving image can be stopped instantly, without blurr, and saved to disk. Colors can be assigned to the moving image and changed at will.

High speed color image processing software can compute a full color still image. Saved images can be used within paint programs, graphic data bases, tutorials, desktop publishing packages, and CAD applications. The A-LIVE! images move, and images can be analysed in real time and, with appropriate software, the II fits industrial applications such as security, robot control and quality assurance, time-motion studies, medical imaging and thermography, and sports medicine.

A-Squared Systems S kyway , Oakland, CA 94619 (415)633-070.

CIRCLE **102** ON READER SERVICE CARD

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Benefits of Co-op membership:

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  (Apple II/GS)
  and/or
  Mac A.P.P.L.E. magazine
  (Macintosh)
- **Hotline / Technical Support** : You can get information and help with almost any Apple-related problem from our staff experts. Our staff is backed up by a group of consultants which are specialists in a variety of areas.
- **Telecommunications** - The wave of the future that you can be a part of. With your Apple and a modem you can send and receive information, messages and programs from the A.P.P.L.E. Crate Bulletin Board Service.
- **Co-op Buying** - You will receive discounts (from 20 to 80 percent) on software, hardware, accessories and publications. Many items that members have found to be invaluable, are sold exclusively through the Co-op.
- **Public Domain Software** - Increase your software library for just pennies a program. Thousands of programs available for Apple II and Macintosh computers.
- **And much more.....**

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ANIMATION AND SPECIAL EFFECTS

Broderbund announces Entry level animation and special effects generator for the aspiring non-artist.

Originally developed for the Apple IIe and IIc market, Fanavision has been entirely rewritten for the IIgs. It now takes advantage of the increased number of colors, speed, and super high resolution screens of the IIgs while retaining the ease of learning of the original program. The enhanced sound capabilities of the IIgs are also supported in a new Fantavision feature: integrated sound. Broderbund will be including a library of digitized sounds to incorporate in Fantavision moves. Fantavision uses the sophisticated 'Tweening' and 'Transformation' tools that enable entry level users to create detailed animation without needing to be an artist or expert animator.

Key Features and Benefits:

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- Creates animation with sophisticated tools designed for the entry level user.
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- Prints animated sequences on Laserwriter, or i n color on Imagewriter II.

Price: $59.95. *Broderbund Software, 17 Paul Drive, San Rafael, CA 94093-2101(415)479-1700.*

CIRCLE **103** ON READER SERVICE CARD

MACROS WITH HARDWARE

Thirdware announces its Keyboard Enhancer, Fingerprint key, which will be available soon. Imagine typing one word or phrase over and over again. It's tedious and time consuming. Fingerprint key lets you program the Control key and a letter key to type and retype that repetitive word or phrase, whenever you need it with just two keystrokes. Whether you're writing in BASIC or your favorite word processor, setting two keystrokes to equal a thousand is convenient and time saving. Convenience is only the tip of the Fingerprint Key iceberg. Macro commands are not new, but Fingerprint key takes the principle a step further and does it with hardware. Once you program keys, a lithium battery backup saves them when you power down, and you can save commands to disk. In two or three years when you have to change batteries, your commands, which you saved on disk, can be downloaded to Fingerprint Key. Let's say your two favorite programs are AppleWorks and PFS anything. The control commands are different for each program. To use both you must learn and remember each set of commands. Not with Fingerprint Key. If you prefer the PFS commands to those of AppleWorks, set up your keyboard to type PFS commands while running AppleWorks.

Also Advertised is a voice recognition and simulator that plugs in the back of the Apple and comes with a set of headphones and a boom mike. It will digitally record and playback your own voice and recognize it. But when a word processing menu is booted and you want to yell SAVE, the computer can't respond. With Fingerprint Key you can plug it in, program it, and when you say SAVE, save it will. You'll be able to command the menu with just your voice. Fingerprint Key makes parlor game hardware into useful addition to computing. The implications for the physically impaired user are serious and enormous. Most people love their MODEMS. What they hate, is dialing all those numbers. With Fingerprint Key two keystrokes dials your SPRINT or MCI, your access number is dialed, your data base number is dialed, your account number is dialed and you only touched two keys. Fingerprint interrupts the link between the keyboard and the computer. It fools the computer into thinking it's getting stroked by the same old keys. Fingerprint Key will be a small board that will plug into Apple IIgs and the IIe. It has a planned capacity of 32K. Price: Less than $200 .

Precision Software Inc., 4747 N.W. 72nd Avenue, Miami, FL 33166. (305)592-7522

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MOUSEFILER FOR IIGS

Harbor Software, Inc., announces the availability of their MouseFiler software program for the Apple IIgs. MouseFiler is a Macintosh-like desktop manager / disk utility for use with the ProDOS operating system that makes file management simple. Most people are bewildered by directories and subdirectories. For the new user, this can be a real source of frustration. MouseFiler, using the intuitive Macintosh style interface, makes activities such as running programs, copying files, and formatting disks much more transparent.

High capacity disks require powerful software to fully utilize their large storage capabilities. The increased prevalence of hard disks, UniDisk 3.5's, the SCSI interface, and the mouse (standard with the Apple IIgs), substantiates the growing need for this kind of utility. MouseFiler provides the capability to subdirectories quickly and easily. It is full featured, powerful, and easy to use. Price: $39.95,

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